

APPENDIX E:

**WETLAND AND FLOODPLAIN ASSESSMENT FOR THE BANGOR
HYDRO-ELECTRIC COMPANY NORTHEAST RELIABILITY INTERCONNECT**

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E.1 INTRODUCTION

Bangor Hydro-Electric Company (BHE) has applied to the U.S. Department of Energy (DOE) to amend Presidential Permit PP-89, which authorizes BHE to construct a single-circuit, 345,000-volt (345-kV) alternating-current (AC) electric transmission line across the U.S.-Canadian international border in the vicinity of Baileyville, Maine. The proposed transmission line would originate at the existing Orrington Substation, located in Orrington, Maine, and extend eastward to the international border, where it would connect with complementary facilities to be constructed, operated, and maintained by New Brunswick Power Corporation. The proposed transmission line, which would improve the reliability of the bulk electric transmission system of the Maritimes area of Canada and of the New England area, is referred to as the Northeast Reliability Interconnect (NRI). The preferred transmission line route is referred to as the Modified Consolidated Corridors Route. Three other alternative routes are analyzed in this environmental impact statement (EIS): the Consolidated Corridors Route, the Previously Permitted Route, and the Maine Electric Power Company (MEPCO) South Route (Figure E-1).

This wetland and floodplain assessment was prepared by DOE pursuant to Executive Order (E.O.) 11988 (May 24, 1977), E.O. 11990 (May 25, 1997), and DOE regulations for implementing these E.O.s, as set forth in Title 10, Part 1022, of the *Code of Federal Regulations* (10 CFR Part 1022) ("Compliance with Floodplain and Wetland Environmental Review Requirements"). This assessment evaluates potential impacts on floodplains and wetlands from the construction and maintenance of the NRI along the alternative routes.

E.2 PROPOSED ACTION

Under the proposed action, a 345-kV AC electric transmission line would be constructed between the Orrington Substation and the U.S.-Canadian international border near Baileyville, Maine, along the Modified Consolidated Corridors Route. Three alternative corridors are also considered: the Consolidated Corridors Route, the Previously Permitted Route, and the MEPCO South Route. Table E-1 provides comparative information for these alternative routes. All alternative routes would use self-supporting wood-pole H-frame structures as the tangent support structure where the line follows a relatively straight path. In addition to tangent structures, angle and dead-end structures would be required (see Section 2.3 of this EIS). These structures would consist of either three wood poles or three steel poles. The wood-pole angle and dead-end structures would use guy wires for support, while the steel-pole structures would be self-supporting. Wood poles would be embedded 9 to 12 ft (2.7 to 3.7 m) into the ground, while steel poles would be embedded 15 to 30 ft (4.9 to 9 m) deep. Each support structure pole plus the area backfilled for the hole would occupy 15 ft² (1.4 m²).

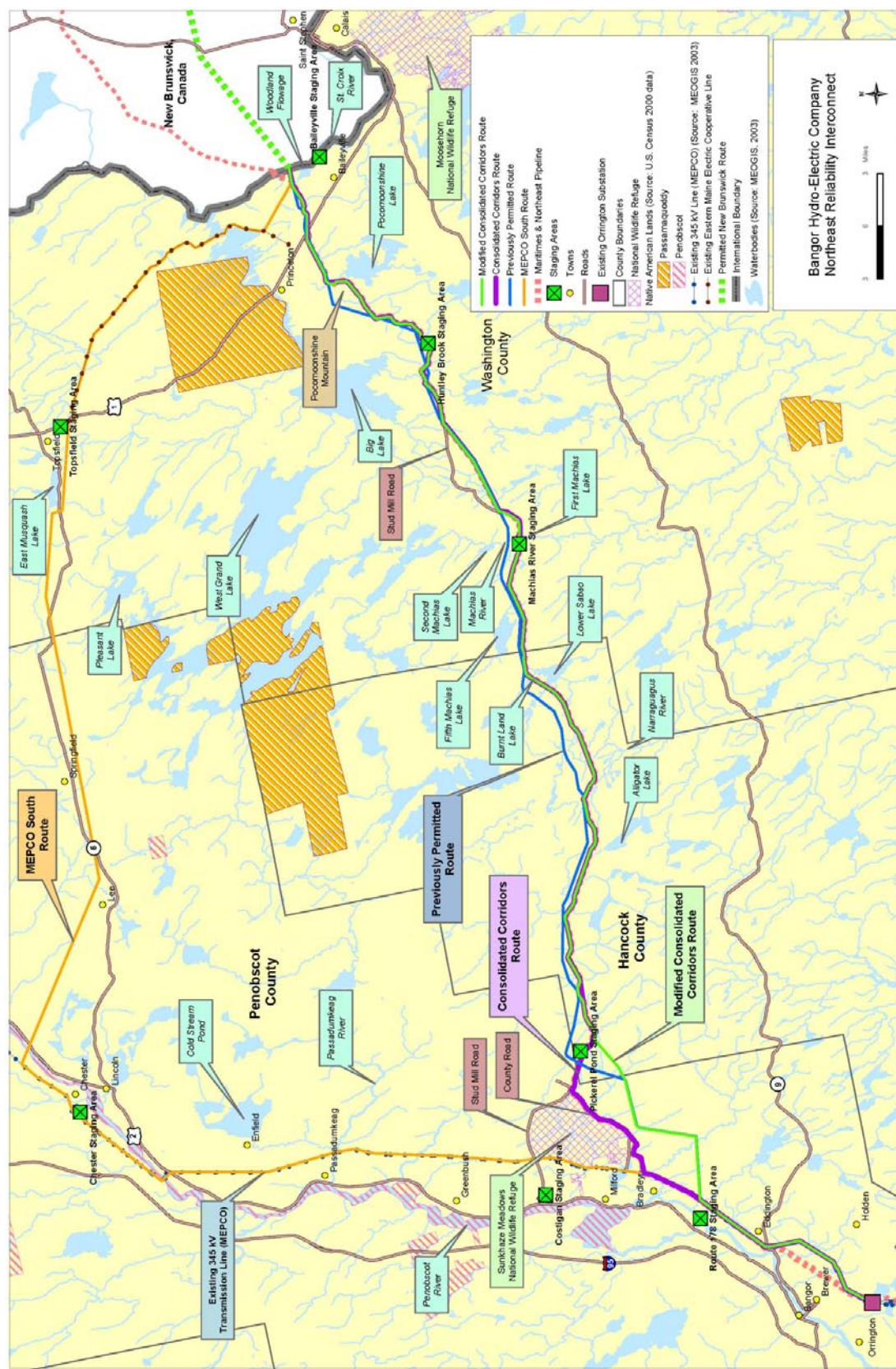


FIGURE E-1 Alternative Route Locations (Source: Paquette 2005g)

TABLE E-1 Comparative Information for the Alternative Routes

Parameter	Alternative Route ^a			
	MCCR	CCR	PPR	MSR
Total length (mi) ^b	85	85	84	114
Length of new 170-ft-wide ROW (mi)	15	2	62	39
Length of 155-ft-wide ROW adjacent to M&N ^c gas pipeline and/or Stud Mill Road (mi)	58	68	10	0
Length of 125-ft-wide ROW adjacent to M&N gas pipeline and existing transmission lines (mi)	7	7	7	7
Length of 100-ft-wide ROW adjacent to existing transmission lines (mi)	5	8	5	68
Area of ROW (acres)	1,566	1,522	1,633	1,734
Total number of support structures	608	636	563	885
Number of tangent structures (2-pole structures)	491	472	499	821
Number of angle and dead-end structures (3-pole structures)	117	164	64	64
Average span length (ft)	731	706	786	680

^a CCR = Consolidated Corridors Route, MCCR = Modified Consolidated Corridors Route, MSR = MEPCO South Route, PPR = Previously Permitted Route.

^b To convert miles to kilometers, multiply by 1.609; to convert feet to meters, multiply by 0.305; to convert acres to hectares, multiply by 0.405.

^c M&N = Maritimes & Northeast Pipeline, L.L.C.

Sources: Paquette (2005a,d,e,f) and BHE (2004).

Trees within the right-of-way (ROW) would be cleared only where necessary in order to facilitate (1) staking, access, assembly, and erection of structures; (2) installation of conductors and shield wires; and (3) provision of adequate clearance for energized lines. Low-growth woody vegetation would be left undisturbed where possible. The clearing program would be planned and implemented to encourage growth of low-growing native plants that would both stabilize the ROW against erosion and minimize the growth of trees. Cutting would involve either clear-cutting or selective cutting. All logs would be removed from the ROW, while stumps would need to be removed primarily only at support structure installation sites. A work area about 100 ft (30.5 m) wide and 170 ft (51.9 m) long [0.4 acre (0.16 ha)] would be required for the construction and installation of each support structure.

No new permanent access roads would be required for construction or maintenance of any of the alternative routes. However, some new temporary access roads might be required to reach the ROWs from existing access roads. A width of 20 ft (6.1 m) was assumed for new temporary access roads, which would require clearing of trees and brush. Stumps would also be removed from some temporary access road areas. The area of clearing required for new temporary access roads for each alternative would be as follows: Modified Consolidated Corridors Route — none; Consolidated Corridors Route — none; Previously Permitted Route —

21.3 acres (8.6 ha); and MEPCO South Route — 32.4 acres (13.1 ha) (BHE 2004, 2005; Paquette 2005a).

ROW clearing is anticipated to begin in the winter so as to take advantage of frozen ground to minimize impacts, especially within wetlands. Before any vegetation cutting, appropriate control measures would be implemented (e.g., silt fences, hay bales, crane mats, organic berms, or mulch; see Sections 2.4.1 and 2.4.2 of the EIS) to minimize the potential for erosion and sedimentation (TRC 2005a). Most tree removal operations would be conducted so as to minimize ground disturbance and other incidental impacts on the environment. Areas that would receive selective cutting include riparian areas along streams and rivers. Generally, riparian buffer zones for herbicide application would be 75 ft (23 m) wide on each side of a stream, while wetland buffer zones for herbicide application would be 25 ft (7.6 m) from the edge of a wetland with standing water. Buffer zones are areas of land along water bodies or wetlands of sufficient width to lessen the entrance of pollutants, such as eroded soil, or to maintain adequate shading.

All clearing would be performed by hand or feller bunchers. No herbicides would be used within wetlands with standing water or their buffers or within riparian buffer zones. To the extent possible, clearing in wetlands involving the use of machinery would be conducted during the winter when the ground is frozen and snow cover is present. Manual cutting of trees could occur at any time of the year.

To minimize induced voltages from the NRI on the Maritimes & Northeast Pipeline, L.L.C. (M&N) gas pipeline facilities, AC mitigation would be required where both facilities are in close proximity. The AC mitigation technique proposed for the M&N gas pipeline would include the installation of a zinc ribbon buried about 1.5 ft (0.5 m) below grade and above the pipeline (see Section 2.3.5 of the EIS). The zinc ribbon would be either plowed in place or installed into an excavated trench that would be backfilled after the ribbon was installed. Although the ribbon would generally be installed where the pipeline crosses wetland, it would not be installed where the existing pipeline crosses streams. AC mitigation would be required for all areas where the transmission line and the M&N gas pipeline are in close proximity, including wetlands. Modeling of induced voltage indicated that AC mitigation could be avoided under streams, to avoid disturbance of stream channels.

Once the line is operational, vegetation management would be required along the ROW. This would consist of the felling of danger trees (trees that could pose a threat to the operation of the line if they grew or fell into the conductor security zone before the next cutting cycle) adjacent to the ROW and control of vegetation within the ROW. Management of vegetation within the ROW would encourage low-growing plant species and discourage tall-growing vegetation. Maintenance clearing would be performed on a 3- to 4-year cycle and would include areas of selective clearing in riparian buffer zones and wetlands. ROW maintenance within buffer zones would be limited to cutting only those trees or portions of trees that could present a safety hazard to the transmission line before the next cutting cycle.

E.3 FLOODPLAINS ALONG THE ALTERNATIVE ROUTES

E.O. 11988, “Floodplain Management,” requires DOE to reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. Floodplain values include the attenuation of the extent of flooding that (1) reduces the risk of flood loss; (2) minimizes the impacts of floods on human safety, health, and welfare; and (3) supports wetlands, fish and wildlife. 10 CFR Part 1022 sets forth DOE guidelines for implementing E.O. 11988.

Base floodplains are the lowlands adjoining inland and coastal waters where there is a 1% chance of flooding in any given year. These floodplains are more often referred to as the 100-year floodplain. Under 10 CFR Part 1022, floodplain boundaries are to be determined from the most authoritative information available relative to site conditions, including Flood Insurance Rate Maps or Flood Hazard Boundary Maps prepared by the Federal Emergency Management Agency (FEMA). The 100-year floodplains in the vicinity of the Modified Consolidated Corridors Route (the preferred route) and the alternative routes were determined from FEMA floodplain maps. Maine State Planning Office data also were used for a portion of the MEPCO South Route. Because surface drainage is poorly developed in the region (see Section 3.4 of the EIS), floodplains are primarily associated with lakes, ponds, and other wetland areas. Floodplains are also associated with streams within the watersheds of the Penobscot, Union, Narraguagus, Machias, East Machias, and St. Croix Rivers. Many areas of the unorganized territories of Maine (under Land Use Regulation Commission [LURC] jurisdiction) in Washington and Hancock Counties are not mapped under the National Flood Program or the Maine State Planning Office. There are few structures in these areas that could be adversely affected by flooding. The number of known crossings of 100-year floodplains within the ROW and the total floodplain distance included are given in Table E-2. Attachment 1 contains the floodplain maps for the Modified Consolidated Corridors Route and the alternative routes.

TABLE E-2 Summary of Floodplain Crossings for the Alternative Routes

Parameter	Alternative Route ^a			
	MCCR	CCR	PPR	MSR
Number of known floodplain crossings within the ROWs	21	21	22	50
Total floodplain distance within known crossings (mi) ^b	2.2	2.8	3.0	9.0

^a CCR = Consolidated Corridors Route, MCCR = Modified Consolidated Corridors Route, MSR = MEPCO South Route, PPR = Previously Permitted Route.

^b To convert miles to kilometers, multiply by 1.609.

E.4 WETLANDS ALONG THE ALTERNATIVE ROUTES

E.O. 11990, "Protection of Wetlands," requires DOE to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. 10 CFR Part 1022 sets forth DOE regulations for implementing E.O. 11990. Under 10 CFR Part 1022, wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, and similar areas.

Wetlands serve a number of valuable functions within the landscape (National Research Council 1995). Surface water storage in wetlands provides for absorbing storm water flows, recharging groundwater, and reducing downstream flood peaks and subsequent damage from floodwaters. Wetlands help maintain water quality by the retention and removal of dissolved substances, sediments, and contaminants. The transformation and cycling of elements in wetlands maintain nutrient levels that promote wood production. Many fish and wildlife species depend on wetlands for habitat. These species contribute to the recreational and aesthetic values of wetlands.

National Wetlands Inventory maps developed by the U.S. Fish and Wildlife Service indicate that the alternative routes cross numerous wetlands (Table E-3). Attachment 2 contains the wetland maps for the alternative routes.

Palustrine forested wetlands are the predominant wetland type occurring within each of the ROWs. Palustrine wetlands, as defined by Cowardin et al. (1979), are generally less than 20 acres (8 ha) in area and have saturated or shallowly inundated soils (a low water level of less

TABLE E-3 Wetlands Crossed by the Alternative Routes

Parameter	Alternative Route ^a			
	MCCR	CCR	PPR	MSR
Total wetland distance crossed (mi) ^b	7.7	6.6	8.2	11.5
Total wetland area within the ROW (acres)	133	108	152	173
Wetlands of special significance (number) ^c	134	128	145	226
Wetlands of special significance (acres)	100	87	118	133

^a CCR = Consolidated Corridors Route, MCCR = Modified Consolidated Corridors Route, MSR = MEPCO South Route, PPR = Previously Permitted Route.

^b To convert miles to kilometers, multiply by 1.609; to convert acres to hectares, multiply by 0.405.

^c Included in total; they include such areas as imperiled or critically imperiled communities, significant wildlife habitats, or peatlands.

Sources: BHE (2004); Paquette (2005a).

than 6.6 ft [2 m]). These wetlands are vegetated by trees, shrubs, herbaceous emergent plants, emergent mosses, or lichens. Palustrine forested wetlands are characterized by woody vegetation more than 20 ft (6 m) tall. The palustrine forested wetlands support vegetation communities composed primarily of softwood species (DOE 1995). Black spruce (*Picea mariana*), northern white cedar (*Thuja occidentalis*), and Eastern larch (*Larix laricina*) are the dominant tree species. Red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*) are common in areas of highly acidic soil. Other common tree species are white pine (*Pinus strobus*) and eastern hemlock (*Tsuga canadensis*), along with some hardwoods, quaking aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), and red maple (*Acer rubra*). The dominant shrub and herbaceous species in forested wetlands are similar to those of scrub-shrub wetlands described below. Forested wetlands dominated by dead trees are usually the result of the creation of beaver ponds and man-made impoundments, or mortality from fires or insect damage.

Other palustrine wetland types present within the ROWs include scrub-shrub wetlands, emergent wetlands, and open water wetlands. Scrub-shrub wetlands support predominantly woody vegetation communities less than 20 ft (6 m) tall, such as true shrubs and small trees. The dominant scrub-shrub species along the alternative routes include speckled alder (*Alnus rugosa*), willow (*Salix* spp.), highbush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), steeple bush (*Spiraea tomentosa*), mountain holly (*Nemopanthus mucronatus*), arrowwood (*Viburnum dentatum*), red osier dogwood (*Cornus sericea*), bog rosemary (*Andromeda polifolia*), sheep laurel (*Kalmia angustifolia*), leather leaf (*Chamaedaphne calyculata*), and young trees of such species as red maple and black spruce (DOE 1995). Dominant herbaceous species include sensitive fern (*Onoclea sensibilis*) and sedges, with sphagnum moss a dominant species in shrubby bogs.

The three types of scrub-shrub wetlands in the vicinity of the alternative routes are inland fresh meadows, wetlands along larger streams, and peat bogs.

Scrub-shrub wetlands along the routes are often intergraded with palustrine emergent wetlands (DOE 1995). Emergent wetlands, such as marshes and wet meadows, are characterized by herbaceous vegetation. Common emergent wetland species in the project area include cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), sedges (*Carex* spp.), and arrowheads (*Sagittaria* spp.).

Open water wetlands, such as small ponds, have less than 30% vegetation cover. Common floating-leaved plants include water lilies (*Nymphaea* spp.), smartweeds (*Polygonum* spp.), spatterdocks (*Nuphar* spp.), and pondweeds (*Potamogeton* spp.). Submerged plants include waterweeds, pondweeds, muskgrasses (*Chara* spp.), milfoils (*Myriophyllum* spp.), coontails (*Ceratophyllum* spp.), bladderworts (*Utricularia* spp.), and buttercups (*Ranunculus* spp.). Open water wetlands generally occur in slightly deeper water than emergent wetlands, with which they are often adjoined.

Lacustrine wetlands are generally larger wetlands, such as lakes and large ponds, with deeper water and a vegetation cover of less than 30%. Vegetation typically includes floating-leaved plants and nonpersistent emergent species.

The alternative routes cross wetlands that are classified as riverine. Riverine wetlands, such as perennial and intermittent streams, are confined within a channel with intermittently or continuously flowing water. These wetlands may be unvegetated or may support nonpersistent emergent vegetation or floating-leaved plants. Depending on the stream gradient and precipitation, they may have high- to low-velocity flows.

Four wetlands of unusual significance occur along the Modified Consolidated Corridors Route. They support rare and exemplary natural communities. A domed bog ecosystem that occurs along the western portion of the route, approximately 20 mi (32 km) from the Orrington Substation, is located outside the ROW. This type of bog is highest in the center, with concentrically patterned convex surfaces and concentric vegetation zones due to nutrient differences, with lower nutrient levels occurring toward the center. This wetland type is considered rare in Maine.

A raised level bog ecosystem that occurs along the eastern portion of the Modified Consolidated Corridors Route, approximately 3 mi (5 km) from the Canadian border, is located outside the ROW. This type of bog is level although somewhat raised, is not concentrically patterned, and often supports black spruce and larch. The Maine Natural Areas Program considers this wetland type to be “apparently secure” in the State of Maine. In addition, a low sedge-buckbean fen lawn is located within the raised level bog; it is also outside the ROW. This type of wetland is characterized by grasslike plants and sphagnum moss, with groundwater at or just above the substrate. This wetland type is considered rare in Maine. Although these wetlands are outside the ROW of the Modified Consolidated Corridors Route, they may be located within the Previously Permitted Route ROW, which is slightly to the north of the Modified Consolidated Corridors Route at this location. Two rare plant species, sheathed sedge (*Carex vaginata*) and showy lady’s slipper (*Cypripedium reginae*), occur in a northern white cedar swamp that is associated with these two wetlands.

Allen Brook, located roughly halfway between the Orrington Substation and the Canadian border, supports a population of alga-like pondweed (*Potamogeton confervoides*), a rare aquatic plant species that is listed by the State of Maine as a species of special concern. This species occurs in streams and ponds with high water quality.

E.5 EFFECTS OF THE PROPOSED ACTION ON FLOODPLAINS

Construction and maintenance of the NRI would occur within 100-year floodplains that are crossed by the ROW and temporary access roads. No permanent access roads would be constructed under the proposed action or alternatives. Temporary access roads would be used to minimize stream crossings by equipment during ROW clearing, support structure placement, and transmission line stringing. Although some temporary access roads would cross 100-year floodplains, no materials would be left in place following project completion. Temporary access roads would be developed primarily by removing woody vegetation, although temporary timber mats would be used in areas with wet soils. Natural drainage patterns across temporary access roads would be maintained, and all stream and wetland crossings would be perpendicular to the stream and wetland boundary. Therefore, natural surface water flow and flood flows would be

maintained. Construction of temporary access roads would not displace floodplain volume, affect the flood storage capacity of 100-year floodplains, or increase flood elevations or frequencies.

The construction and placement of some transmission line support structures, along with the establishment of temporary work areas, would occur within 100-year floodplains along the preferred route and the alternative routes. No other structures or facilities would be constructed within floodplains. The conservative averaged 100-year floodplain area within the ROW for the alternative routes is as follows: Modified Consolidated Corridors Route — 2.2 acres (0.9 ha); Consolidated Corridors Route — 2.7 acres (1.1 ha); Previously Permitted Route — 2.8 acres (1.1 ha); and MEPCO South Route — 3.7 acres (1.5 ha). Therefore, the volume of a 1-ft (0.3-m)-deep flood would be 2.2 ac-ft (2,700 m³) for the Modified Consolidated Corridors Route; 2.7 ac-ft (3,340 m³) for the Consolidated Corridors Route; 2.8 ac-ft (3,480 m³) for the Previously Permitted Route; and 3.7 ac-ft (4,590 m³) for the MEPCO South Route. (An acre-foot [ac-ft] of water is the volume of water that covers 1 acre [43,560 ft²] to a depth of 1 ft [0.30 m].) The presence of support structures would result in the displacement of a small amount of floodplain volume. Each pole would occupy 15 ft² (1.4 m²), resulting in the displacement of 15 ft³ (0.42 m³) for a flood depth of 1 ft (0.3 m). A support structure would thus displace only a small portion of the flood storage capacity of 100-year floodplains. Therefore, there would be no direct or long-term effects on floodplain values or lives and property from construction and maintenance of the NRI.

E.6 EFFECTS OF THE PROPOSED ACTION ON WETLANDS

The alternative routes would cross a large number of wetlands (Table E-3). Table E-4 lists the acreage of forested wetlands that would be converted to scrub-shrub or emergent wetlands as a result of NRI construction. Tree removal might initially result in indirect wetland impacts, such as changes in soil moisture, erosion of exposed substrates, or sedimentation of downgradient wetland areas. However, the implementation of mitigative measures described in Section 2.4 (e.g., silt fences, hay bales, crane mats, organic berms, and mulch) would help avoid or minimize indirect impacts on wetlands from tree removal. Although some forested wetland habitat would be permanently replaced by other wetland types, this wetland type would continue to be predominant in the vicinity of the alternative routes. Tree removal would not result in a change in total wetland area. Wetland types in the ROWs other than forested wetlands (i.e., scrub-shrub and emergent wetlands) generally would not require removal of vegetation.

Fill material would be placed in some wetland areas during construction of the transmission line support structures. The placement of poles within wetlands would be required for a small percentage of structures (4.6 to 6.4%) for any alternative route. Each pole, along with the area backfilled for the hole, would require a surface area of approximately 15 ft² (1.4 m²). The number of structures and poles placed in wetlands for each route is given in Table E-3, along with the wetland fill area.

New temporary access roads in wetlands would be constructed only when no other practical means would be available to access the ROW or when construction could not be

TABLE E-4 Impacts of the Proposed Project on Wetlands

Parameter	Alternative Route ^a			
	MCCR	CCR	PPR	MSR
Forested wetland converted to scrub-shrub wetland (acres)	70	53	103	73
Number of support structures (and number of poles) in wetlands	34 (73)	29 (62)	36 (77)	51 (109)
Percent of total support structures in wetlands	5.6	4.6	6.4	5.8
Wetland area filled by support structure poles				
Square feet	1,095	930	1,155	1,635
Acres	0.03	0.02	0.03	0.04

^a CCR = Consolidated Corridors Route, MCCR = Modified Consolidated Corridors Route, MSR = MEPCO South Route, PPR = Previously Permitted Route.

^b To convert acres to hectares, multiply by 0.405; to convert square feet to square meters, multiply by 0.093.

Sources: BHE (2004); Paquette (2005a,b).

conducted during winter when the ground is frozen. When these roads would no longer be needed, the materials used to construct them would be removed from the wetlands. The wetlands would then be restored to their previous state, to the extent practicable. No temporary access roads would be required in wetlands for the Modified Consolidated Corridor Route or the Consolidated Corridors Route. Two such roads would be required for the Previously Permitted Route, and 11 would be needed for the MEPCO South Route. In addition, a temporary access road would be required across Stevens Brook for the MEPCO South Route (Paquette 2005a). No forested wetland areas would be converted to scrub-shrub or emergent wetland for access roads along the Modified Consolidated Corridor Route, Consolidated Corridor Route, or Previously Permitted Route. About 0.6 acre (0.2 ha) of forested wetlands would be impacted for a temporary access road required for the MEPCO South Route.

Installation of AC mitigation for the M&N pipeline would require the disturbance of some wetland areas. On the basis of the mean percentage of the alternative routes that makes up wetlands (8.7%) and the area of AC mitigation required, approximately 7 acres (2 ha) would be disturbed for the Modified Consolidated Corridors, Consolidated Corridors, and the Previously Permitted Routes. Wetland disturbance for installation of AC mitigation for the MEPCO South Route would be about 5 acres (2 ha). AC mitigation installation would require excavation of soils immediately above the pipeline. These areas were previously disturbed during initial pipeline installation in 1999. They now support wetland emergent habitat that has developed since that time. Wetlands disturbed during trenching would be restored with the original topsoil to the original grade and seeded with annual grass. It is expected that these wetlands would recover within one or two growing seasons following installation of AC mitigation.

Construction activities could result in indirect impacts on wetlands, such as soil compaction or alteration of surface water runoff patterns and groundwater flows, where heavy equipment is operated or on upland areas adjacent to wetlands. Erosion of soils from nearby upland areas could result in sedimentation in wetlands, and exposure of wetland soils could result in loss of these soils during storm events. Sedimentation can adversely impact wetland biota and decrease biodiversity. Spills of fuels or other fluids in or near wetlands could contaminate wetland soils and adversely affect wetland biota. However, the implementation of mitigation measures (such as erosion and sedimentation controls and operating equipment in winter; see Section 2.4.2 of the EIS) would minimize the likelihood of such impacts.

Because the area of the wetlands affected by construction of the NRI would be small in relation to the total amount of wetlands present in the project area, this reduction in the amount of wetlands or wetland functions would not be expected to measurably affect local wildlife populations, flood flows, water quality, or groundwater levels.

Four wetlands of unusual significance (the domed bog ecosystem, raised level bog, and low sedge-buckbean fen lawn) would be located near but outside the ROWs for the Modified Consolidated Corridors, Consolidated Corridors, and Previously Permitted Routes (BHE 2004, 2005). No wetlands of unusual significance would be located within or near the MEPCO South Route (BHE 2004). However, while the Modified Consolidated Corridors Route passes just to the south of the raised level bog and low sedge-buckbean fen lawn, the Previously Permitted Route runs slightly north in this area and may cross these wetlands. The transmission line for all routes would be located downstream of the domed bog, which occurs along Birch Stream. These wetlands were avoided during development of the Modified Consolidated Corridors Route (the preferred route), and indirect impacts would be avoided during clearing and construction activities. For this route, poles for support structures would not be placed in the northern white cedar swamp associated with the raised level bog and low sedge-buckbean fen lawn crossed by the ROW. Clearing and construction in the vicinity of these wetlands would be conducted only in winter to minimize impacts on the substrate and sensitive vegetation. No herbicides would be used near these areas during or after construction. As a result, construction and maintenance of the transmission line would not alter the hydrology or vegetation communities of these wetland areas. Impacts associated with the Previously Permitted Route could result from the placement of support structures in the wetlands; however, these wetlands could potentially be avoided during pole placement. Clearing of the Previously Permitted Route ROW would remove many of the trees in these wetlands within the ROW. Although the ROWs cross Allen Brook, which supports a population of alga-like pondweed, no construction work would be conducted in or near the brook. The nearest pole would be more than 100 ft (30.5 m) from the stream. No access roads would be constructed in the immediate area. Allen Brook is bordered by low vegetation, and clearing along the stream would not be required. Future vegetation maintenance, if any were needed, would be limited and performed mechanically rather than with herbicides. Therefore, water quality in Allen Brook would not be adversely affected.

E.7 CONCLUSION

Three alternative transmission line routes were considered in addition to the Modified Consolidated Corridors Route (the preferred route). Each route was selected with environmental considerations in mind, including the minimization of impacts on sensitive environmental resources such as wetlands and floodplains. However, each route would impact a varying number of wetlands and floodplains (Table E-4). Under the Rescission of the Presidential Permit Alternative, the transmission line would not be constructed; thus, associated impacts on floodplains and wetlands would not occur. However, no practicable alternative would completely avoid impacts on floodplains and wetlands and still meet project requirements.

For construction along any of the alternative routes, a number of mitigative measures would be implemented to avoid or minimize the impacts on floodplains and wetlands (BHE 2005). These mitigation measures are listed in Sections 2.4.1 and 2.4.2 of this EIS. The following are among the more pertinent measures:

- Support structures would be placed to avoid wetlands and floodplains to the extent practicable.
- Temporary access roads would avoid wetlands to the extent practicable.
- Wetlands would generally be avoided during operation of machinery and vehicles.
- No equipment would be operated in water.
- Corduroy log mats and crane mats may be used to operate equipment on wet soils.
- Buffer zones would be established around wetlands for greater protection.
- No herbicides would be used in wetlands with standing water or their buffer zones.
- Selective cutting would include only those trees that would encroach into the security zone before the next maintenance cycle.
- Cutting would be conducted by hand or feller bunchers to minimize disturbance of soil and biota.
- Mechanized tree removal and construction activities in wetlands would be conducted in winter on frozen ground with snow cover to the extent practicable to avoid disturbance of soil and biota.
- Ground disturbance would be minimized during the handling of cut trees.

- Erosion control measures, such as hay bales, silt fences, and organic berms, would be used to minimize sedimentation in wetlands.
- Vegetation removal would be designed to avoid the formation of new drainage channels in erodible areas.
- Natural drainage patterns would be maintained across temporary access roads.
- Materials used on temporary access roads would be removed following project completion, and disturbed wetland areas would be restored.

Project impacts on floodplains and wetlands are expected to be minor. Construction of the NRI would add incrementally to wetland losses and disturbances from road construction, existing transmission line construction, M&N gas pipeline construction, forestry practices, industrial and residential development, and recreational activities (e.g., all-terrain vehicle use).

E.O. 11990, "Protection of Wetlands," requires Federal agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial uses of wetlands. DOE regulations for implementing E.O. 11990 as well as E.O. 11988, "Floodplain Management," are established in 10 CFR Part 1022. BHE has submitted applications for a Clean Water Act (CWA) Section 404 general permit from the U.S. Army Corps of Engineers and a CWA Section 401 Water Quality Certification from the State of Maine for unavoidable impacts on wetlands. The applicant has developed an erosion and sedimentation control plan and a post-construction vegetation maintenance plan (TRC 2005a,b) that would minimize impacts on floodplains and wetlands.

E.8 REFERENCES

BHE (Bangor Hydro-Electric Company), 2004, *Northeast Reliability Interconnect Alternatives Analysis*, Draft, Bangor, Maine, Dec.

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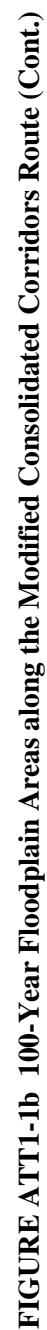
ATTACHMENT 1:

**FLOODPLAIN MAPS FOR THE BANGOR HYDRO-ELECTRIC COMPANY
NORTHEAST RELIABILITY INTERCONNECT ALTERNATIVE ROUTES**

ATTACHMENT 1:**FLOODPLAIN MAPS FOR THE BANGOR HYDRO-ELECTRIC COMPANY
NORTHEAST RELIABILITY INTERCONNECT ALTERNATIVE ROUTES**

This attachment contains detailed 100-year floodplain maps for the proposed project. Figures ATT1-1a through ATT1-1g show the mapped 100-year floodplains along the Modified Consolidated Corridors Route, which is the applicant's and DOE's preferred alternative. The 100-year floodplains shown in Figures ATT1-1a and ATT1-1b would also occur along the Consolidated Corridors, Previously Permitted, and MEPCO South Routes as all four of the alternative routes are the same between the Orrington Substation and Blackman Stream (Figure E-1). The mapped 100-year floodplains for the Consolidated Corridors and Previously Permitted Routes, starting at Blackman Stream, are shown in Figures ATT1-2a through ATT1-2e. Figures ATT1-3a through ATT1-3s show the mapped 100-year floodplains along the MEPCO South Route starting from east of Bradley where the MEPCO South Route and Consolidated Corridors Route diverge.





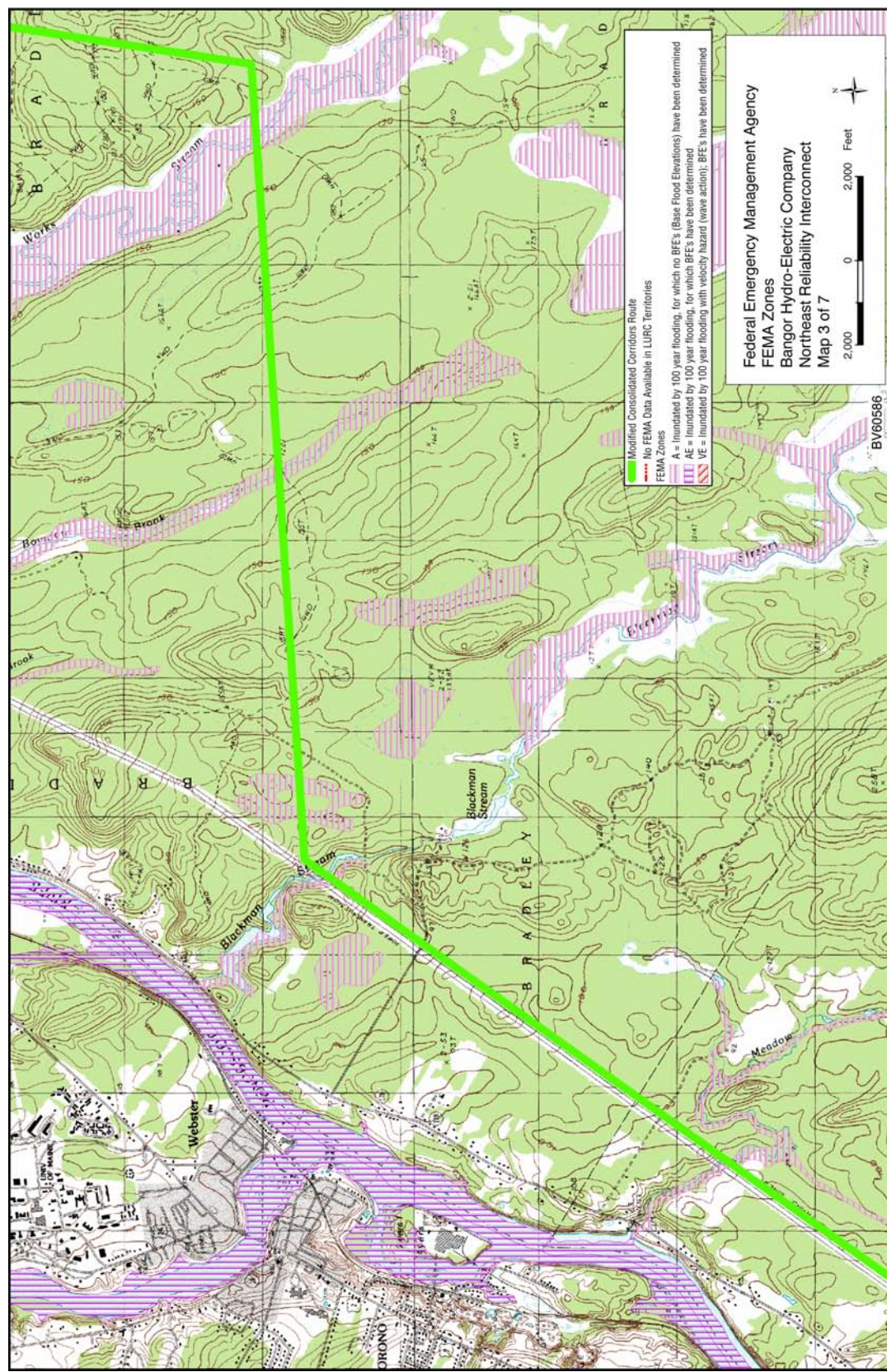


FIGURE ATT1-1c 100-Year Floodplain Areas along the Modified Consolidated Corridors Route (Cont.)

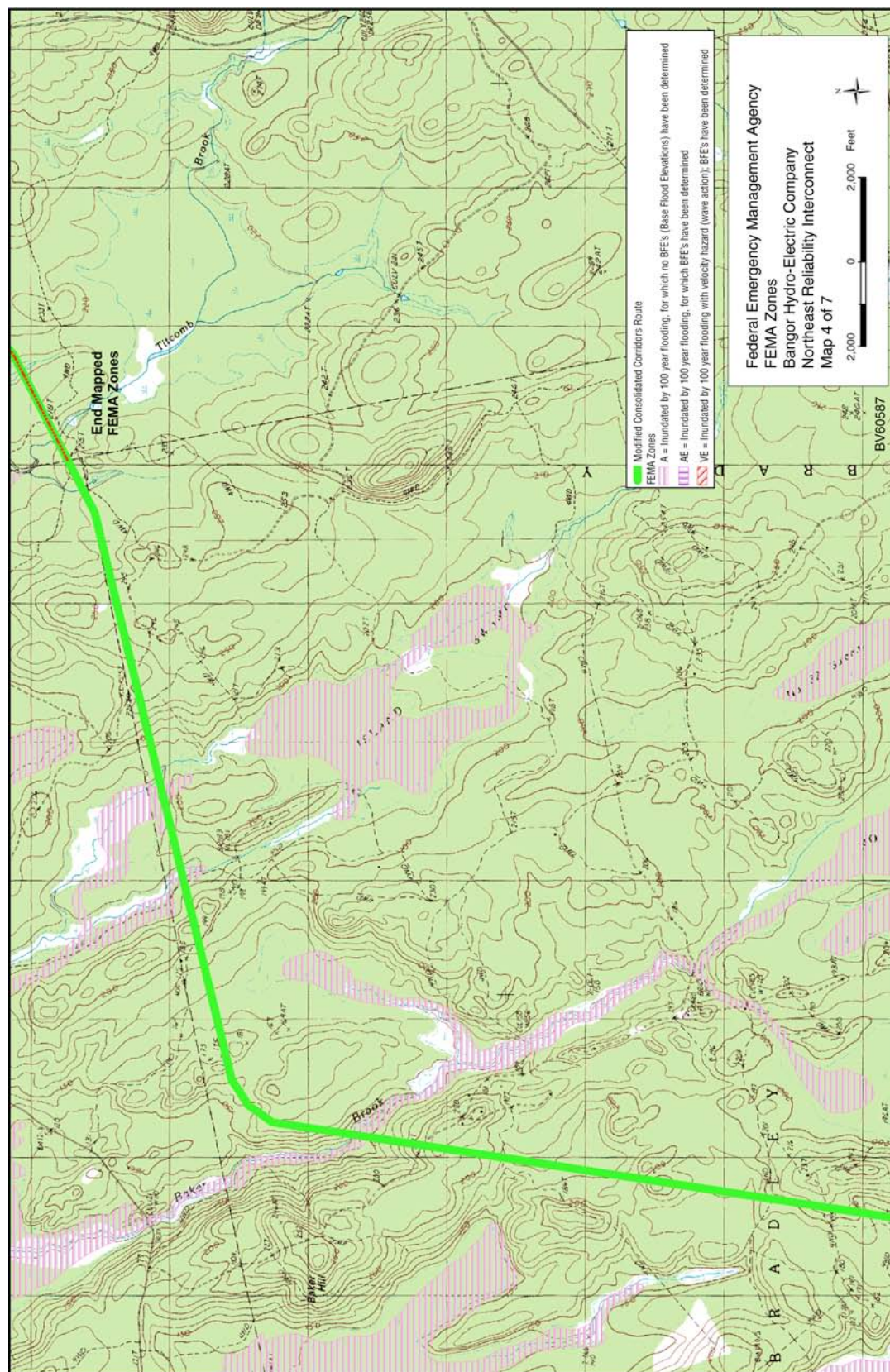


FIGURE ATT1-1d 100-Year Floodplain Areas along the Modified Consolidated Corridors Route (No FEMA data are available for LURC territories) (Cont.)

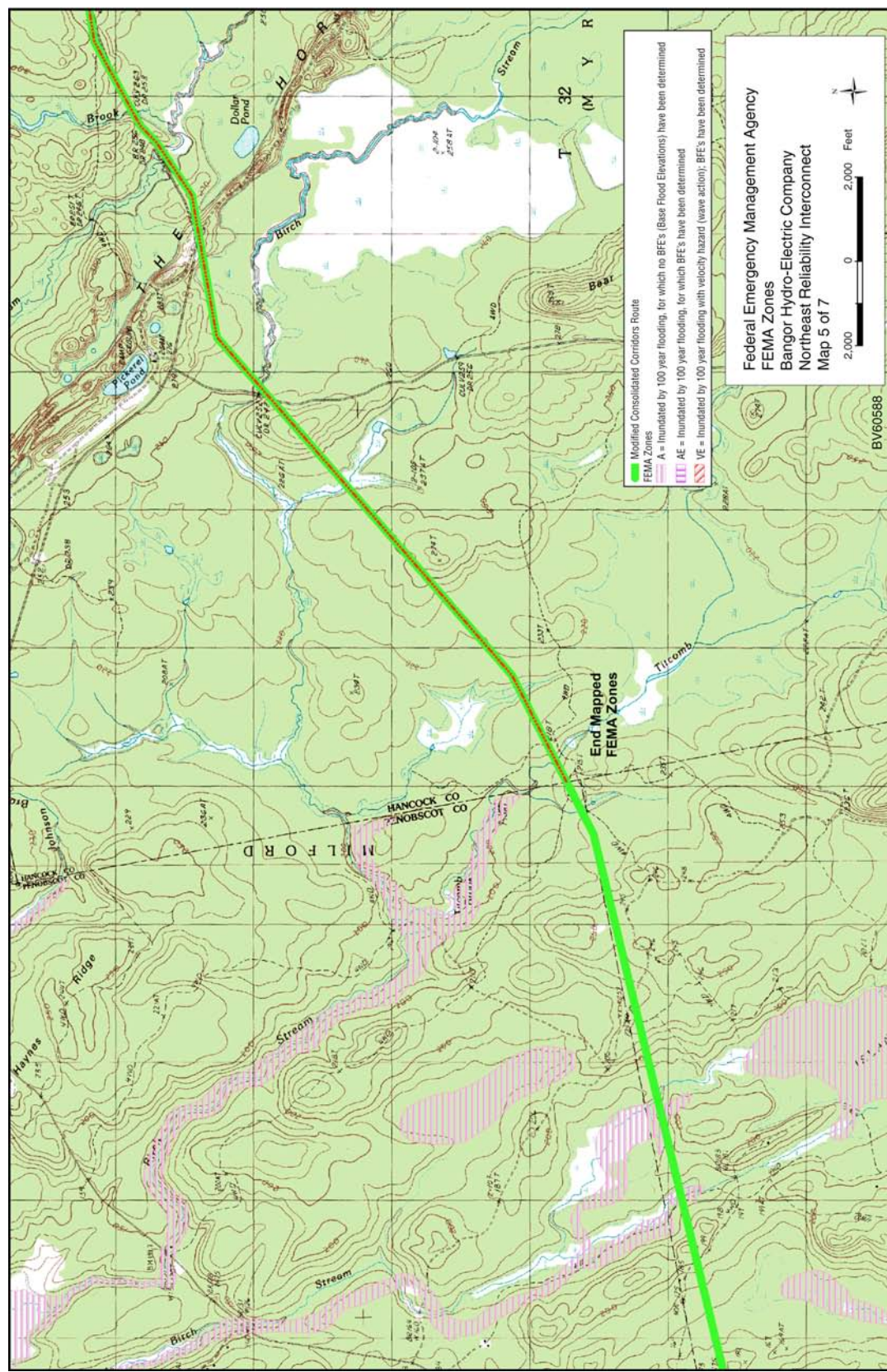


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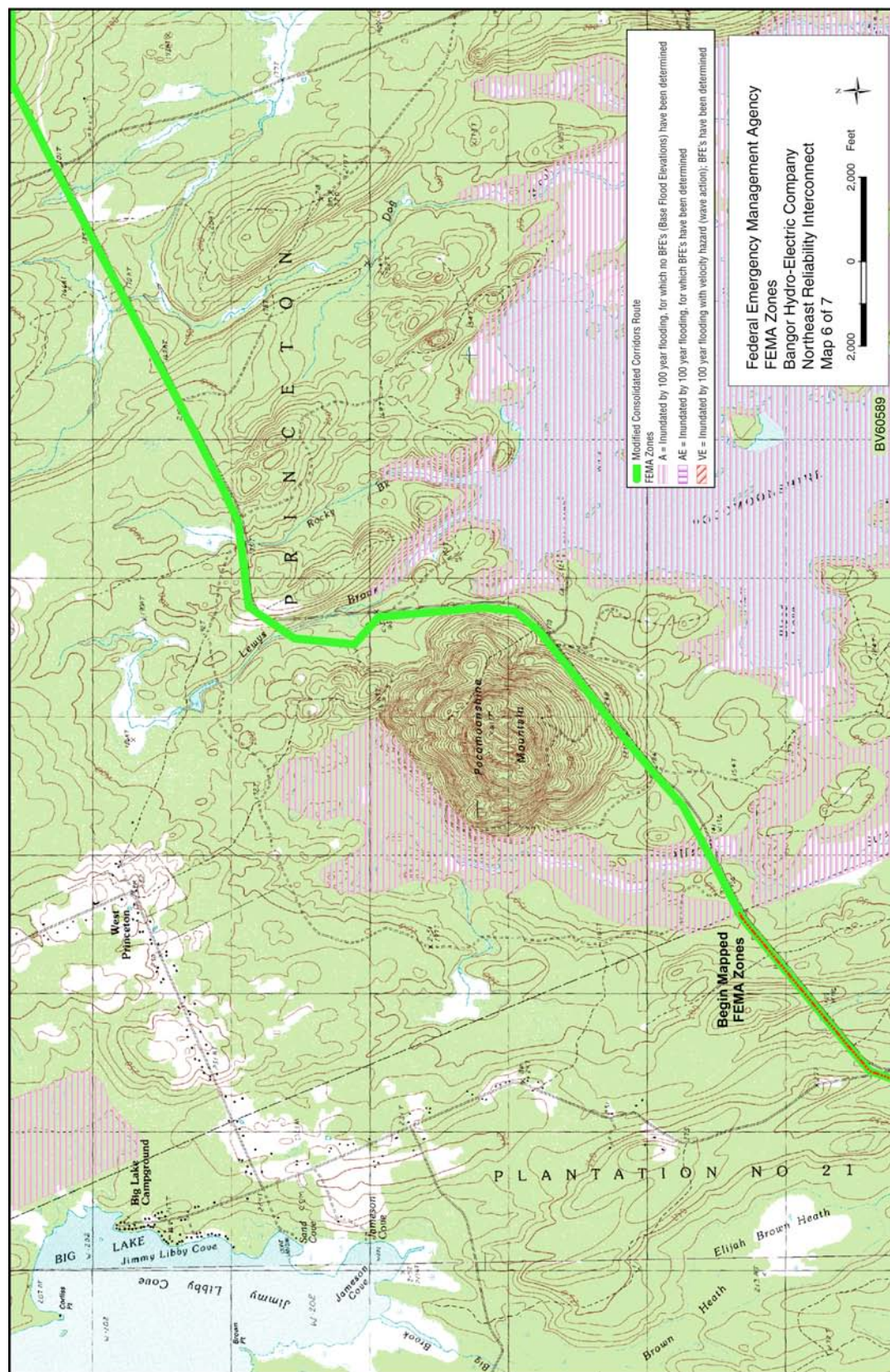


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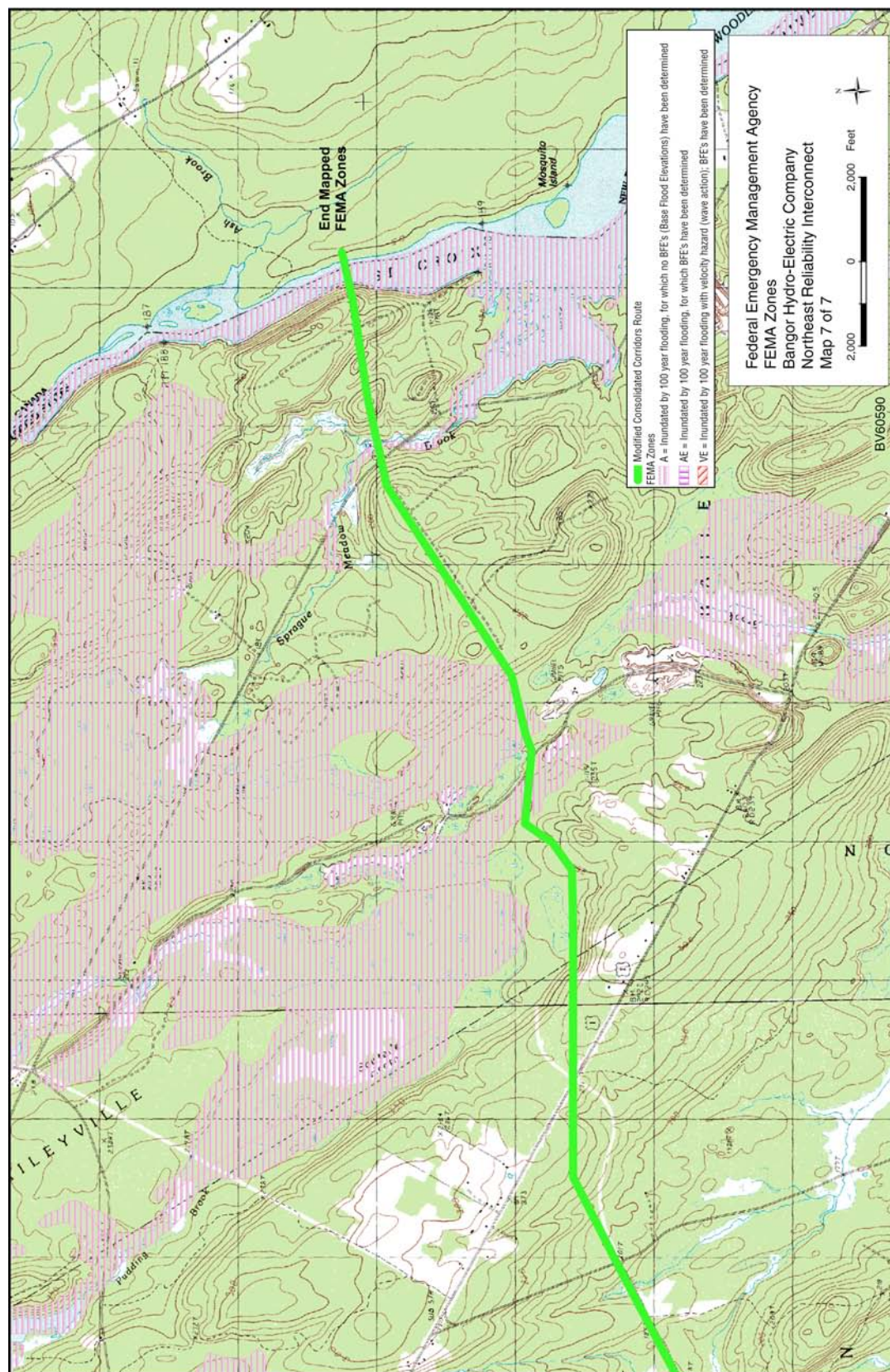


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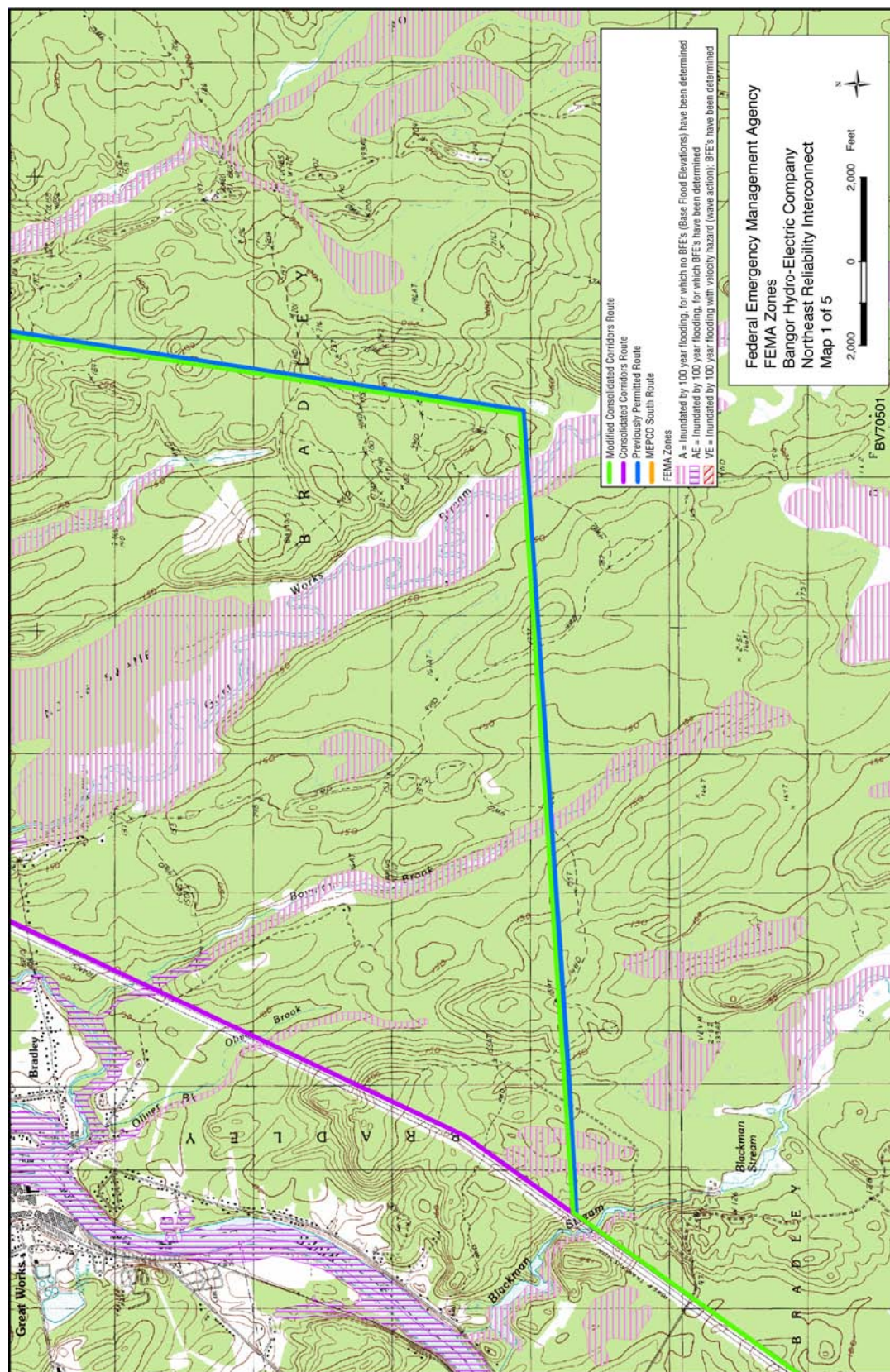


FIGURE ATT1-2a 100-Year Floodplain Areas along the Consolidated Corridors and Previously Permitted Routes
(Source: Saucier 2005)

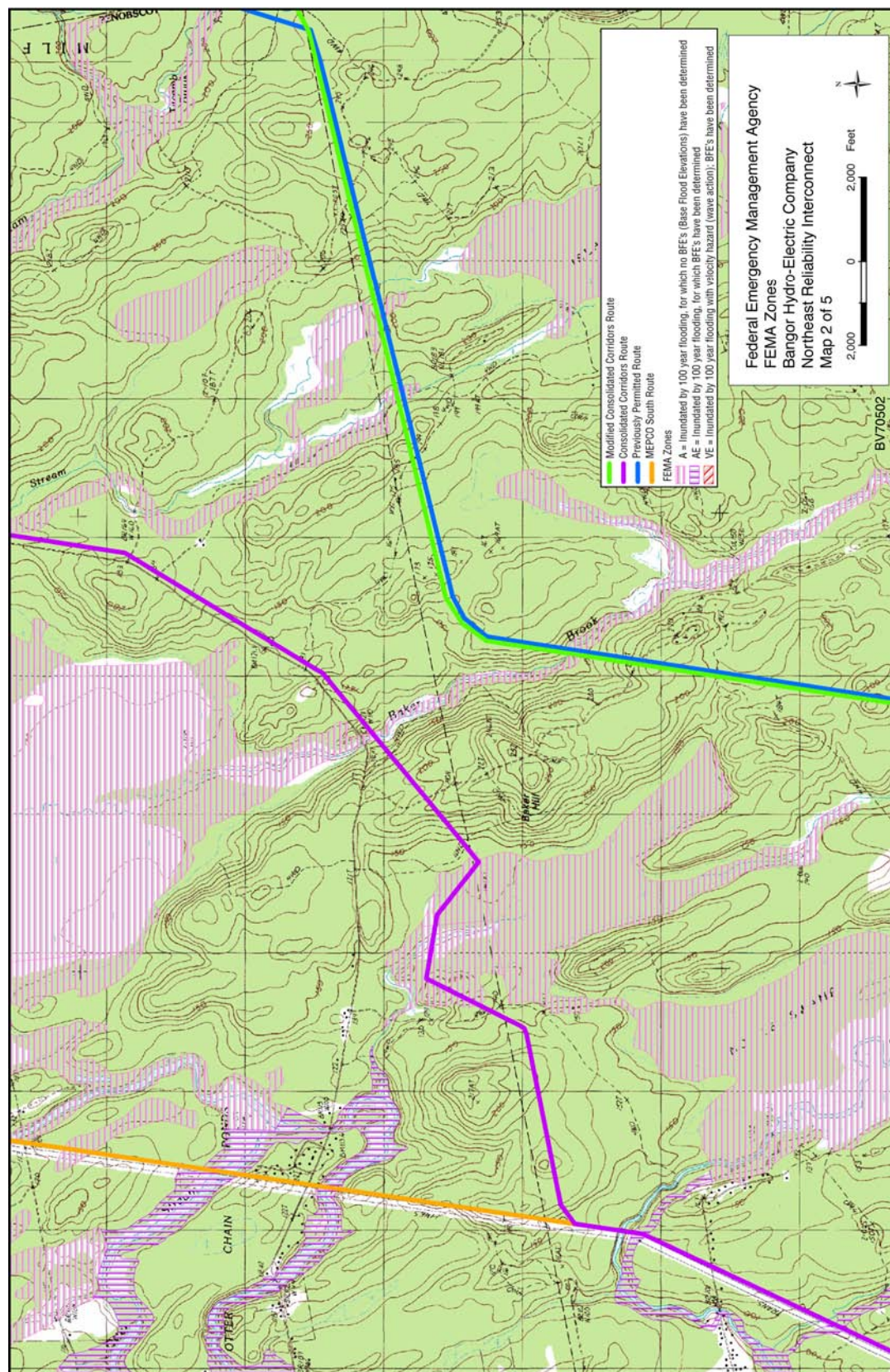
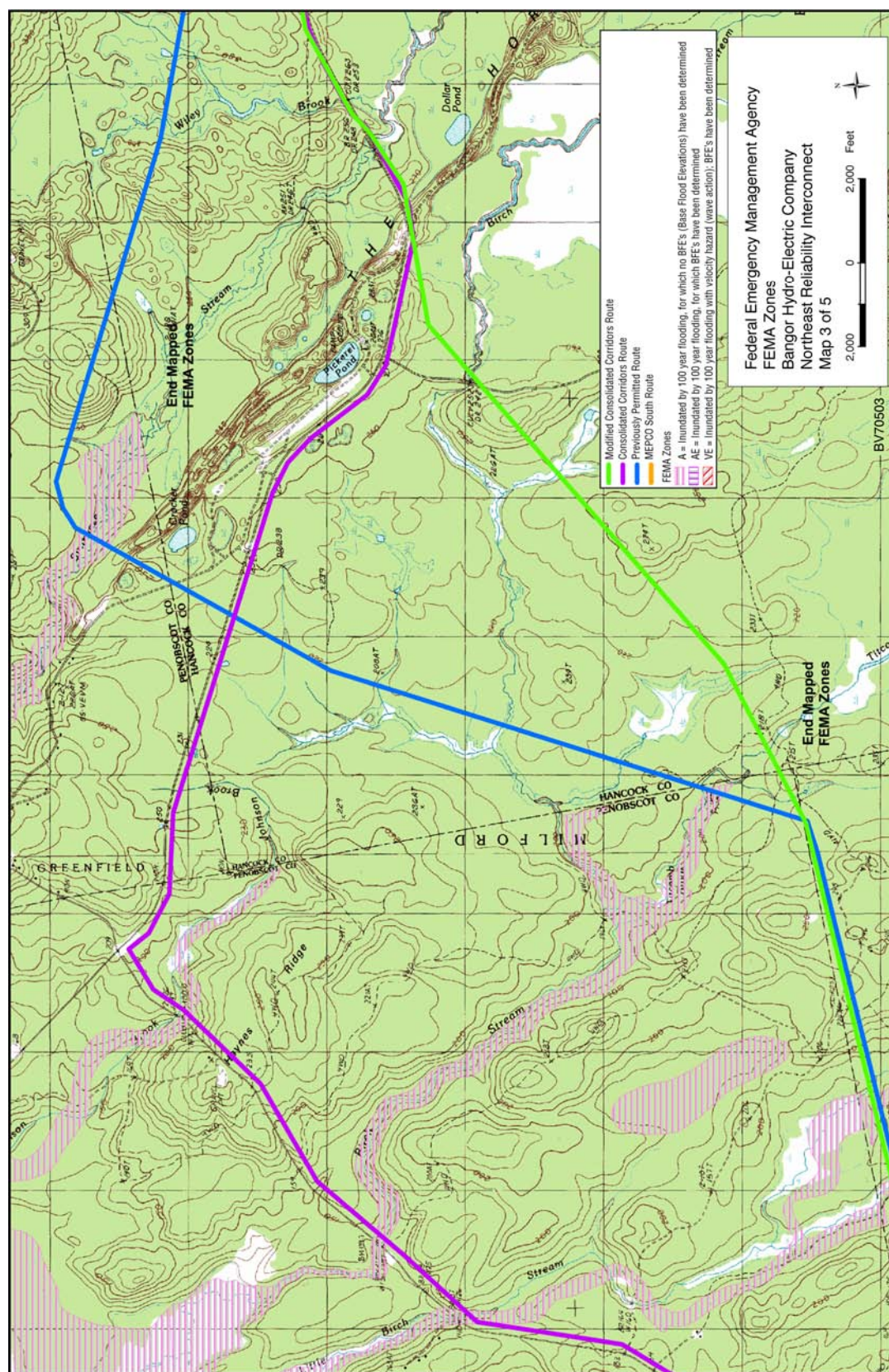


FIGURE ATT1-2b 100-Year Floodplain Areas along the Consolidated Corridors and Previously Permitted Routes (Cont.)



**FIGURE ATT1-2c 100-Year Floodplain Areas along the Consolidated Corridors and Previously Permitted Routes
(No FEMA data are available for the Land Use Regulation Commission territories) (Cont.)**

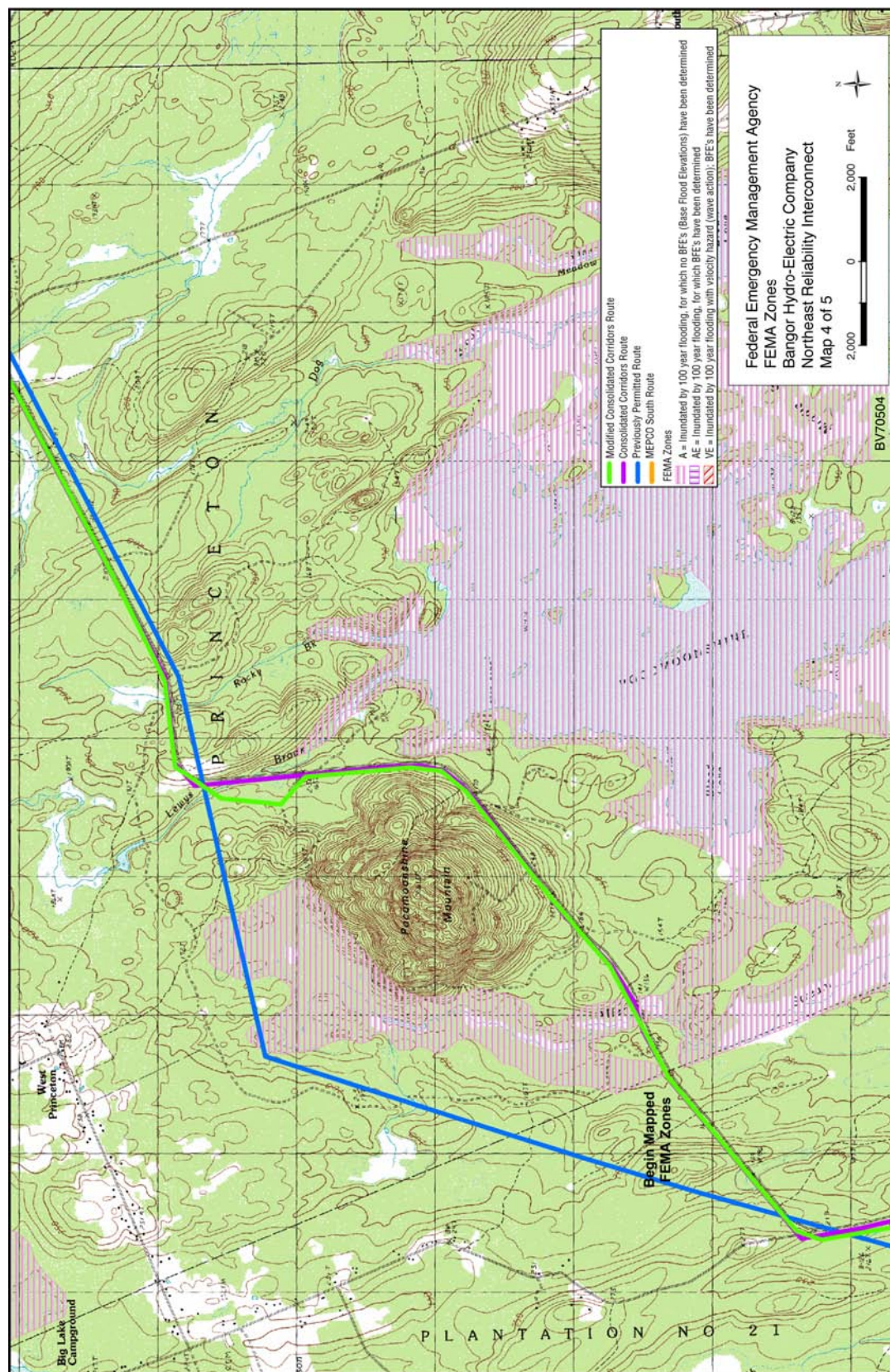


FIGURE ATT1-2d 100-Year Floodplain Areas along the Consolidated Corridors and Previously Permitted Routes
 (No FEMA data are available for the Land Use Regulation Commission territories) (Cont.)

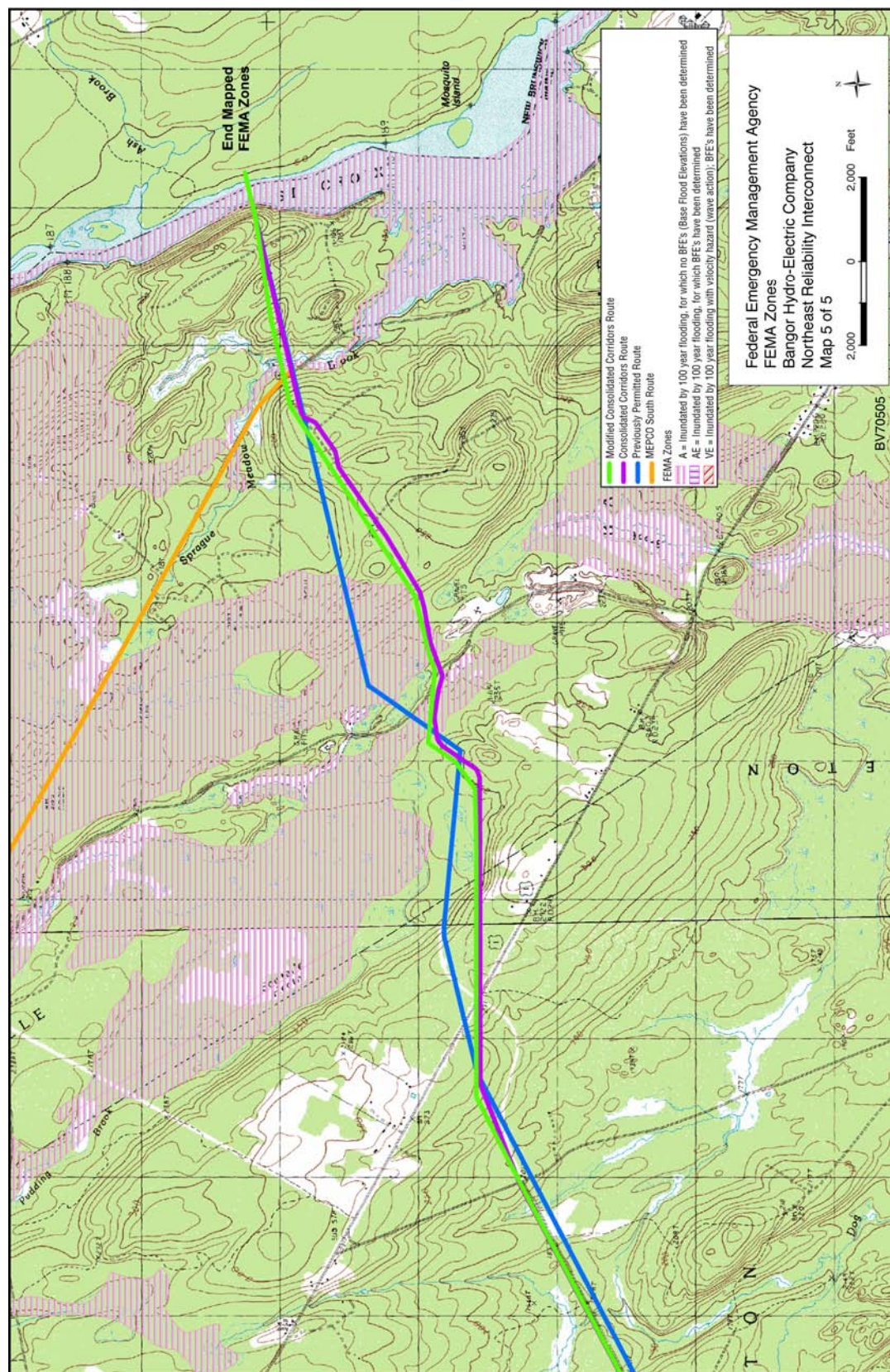


FIGURE ATT1-2e 100-Year Floodplain Areas along the Consolidated Corridors and Previously Permitted Routes (Cont.)

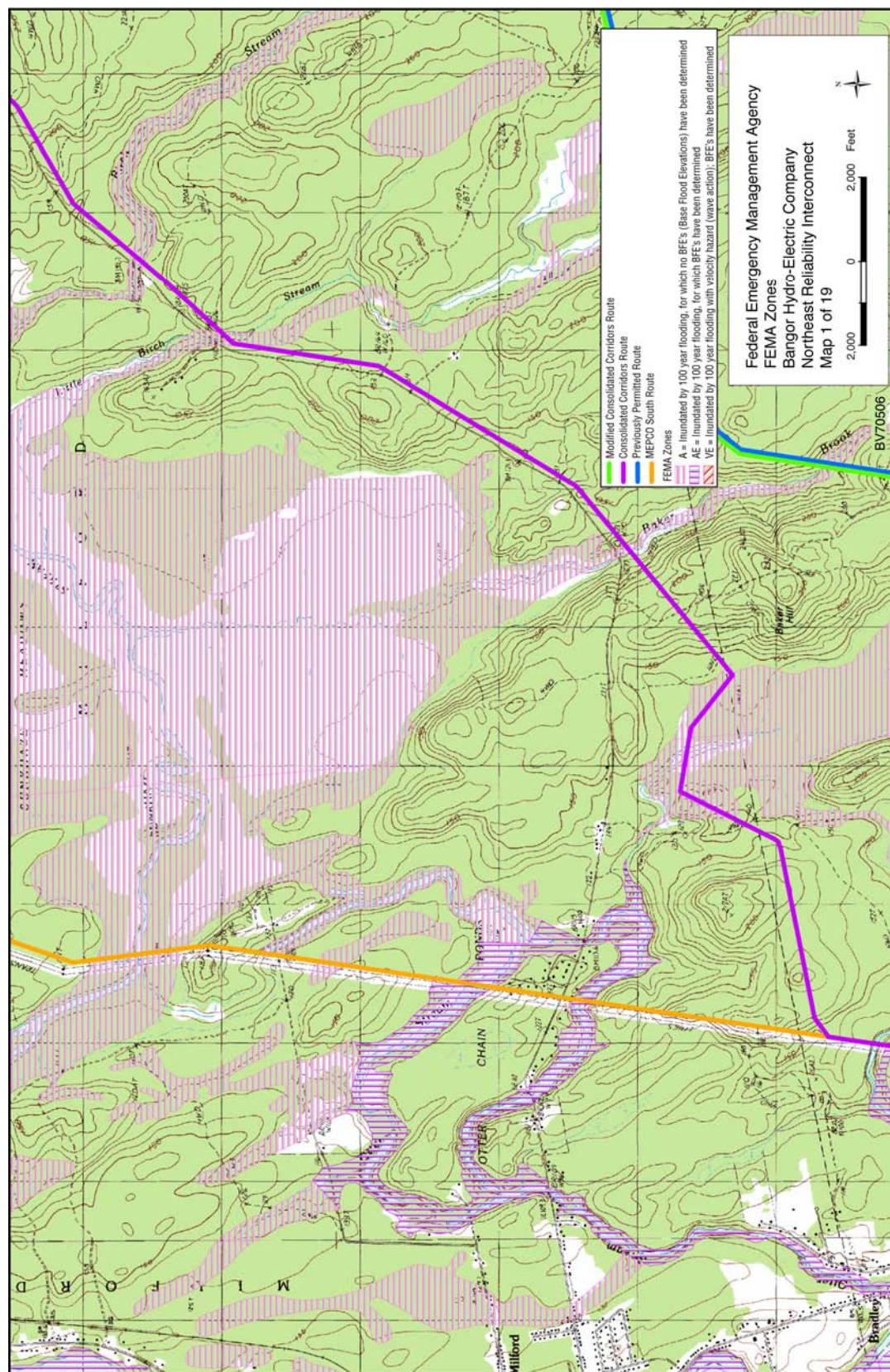


FIGURE ATT1-3a 100-Year Floodplain Areas along the MEPCO South Route (Source: Saucier 2005)

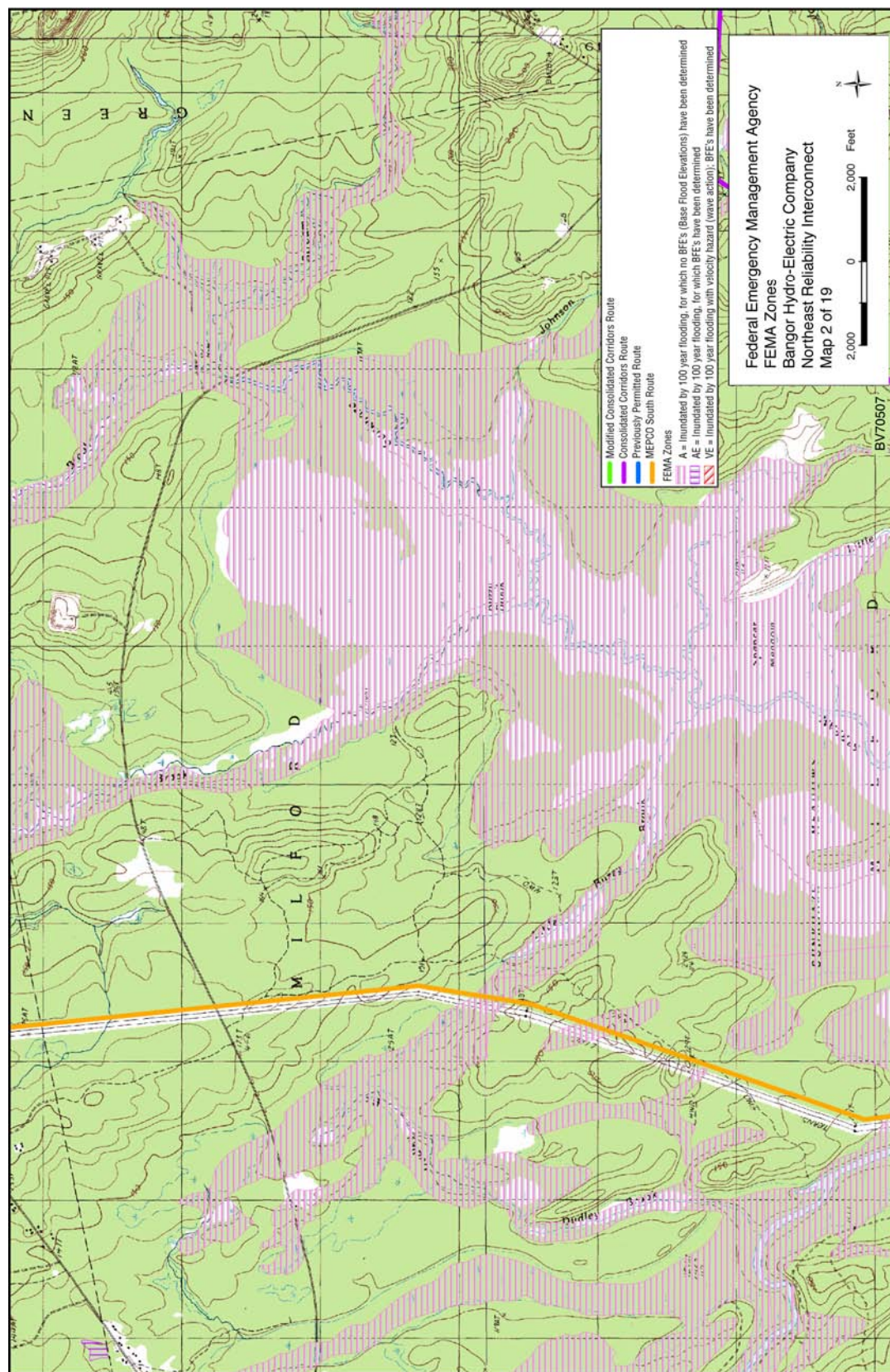


FIGURE ATT1-3b 100-Year Floodplain Areas along the MEPCO South Route (Cont.)

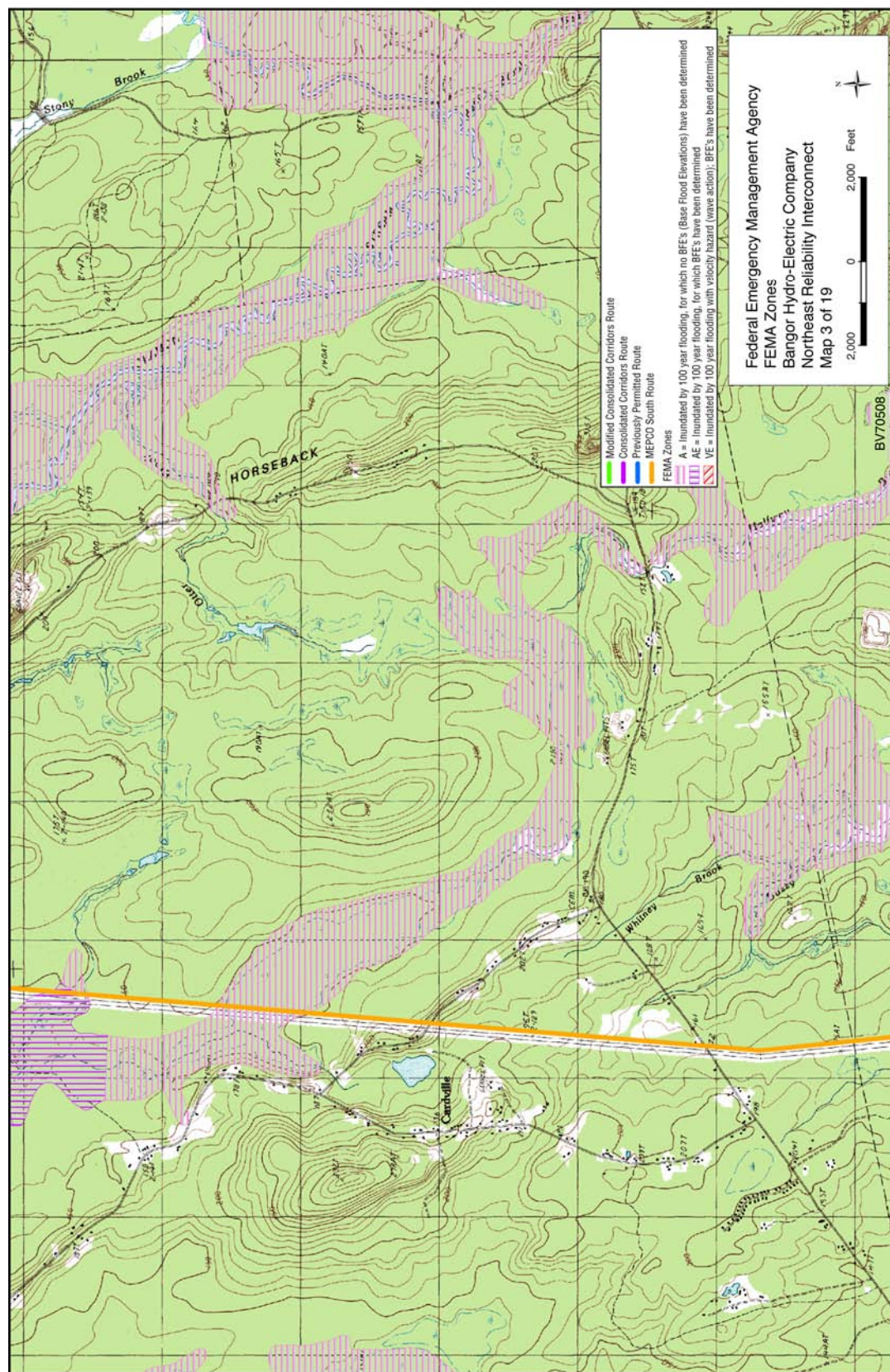


FIGURE ATT1-3c 100-Year Floodplain Areas along the MEPCO South Route (Cont.)

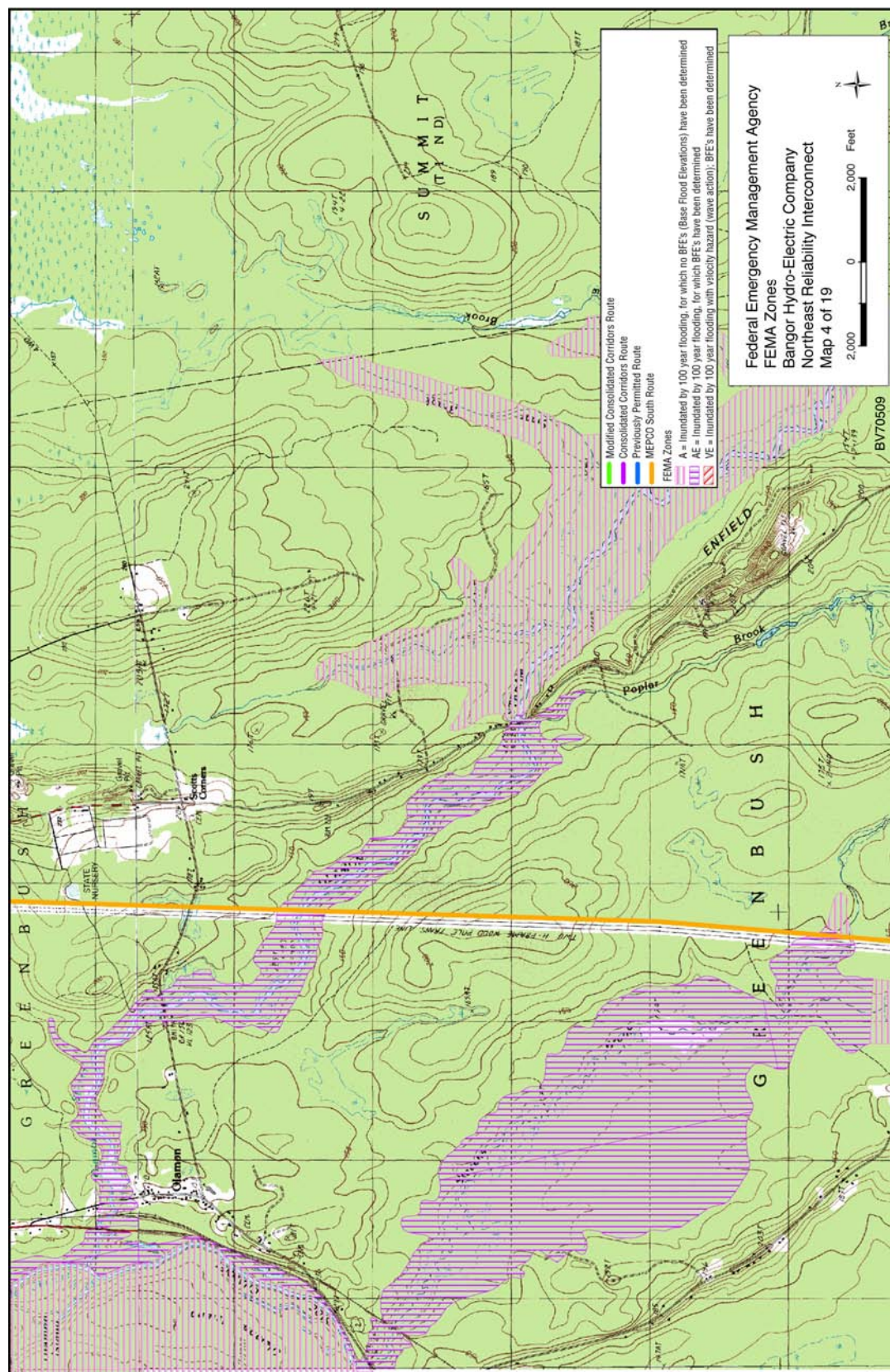


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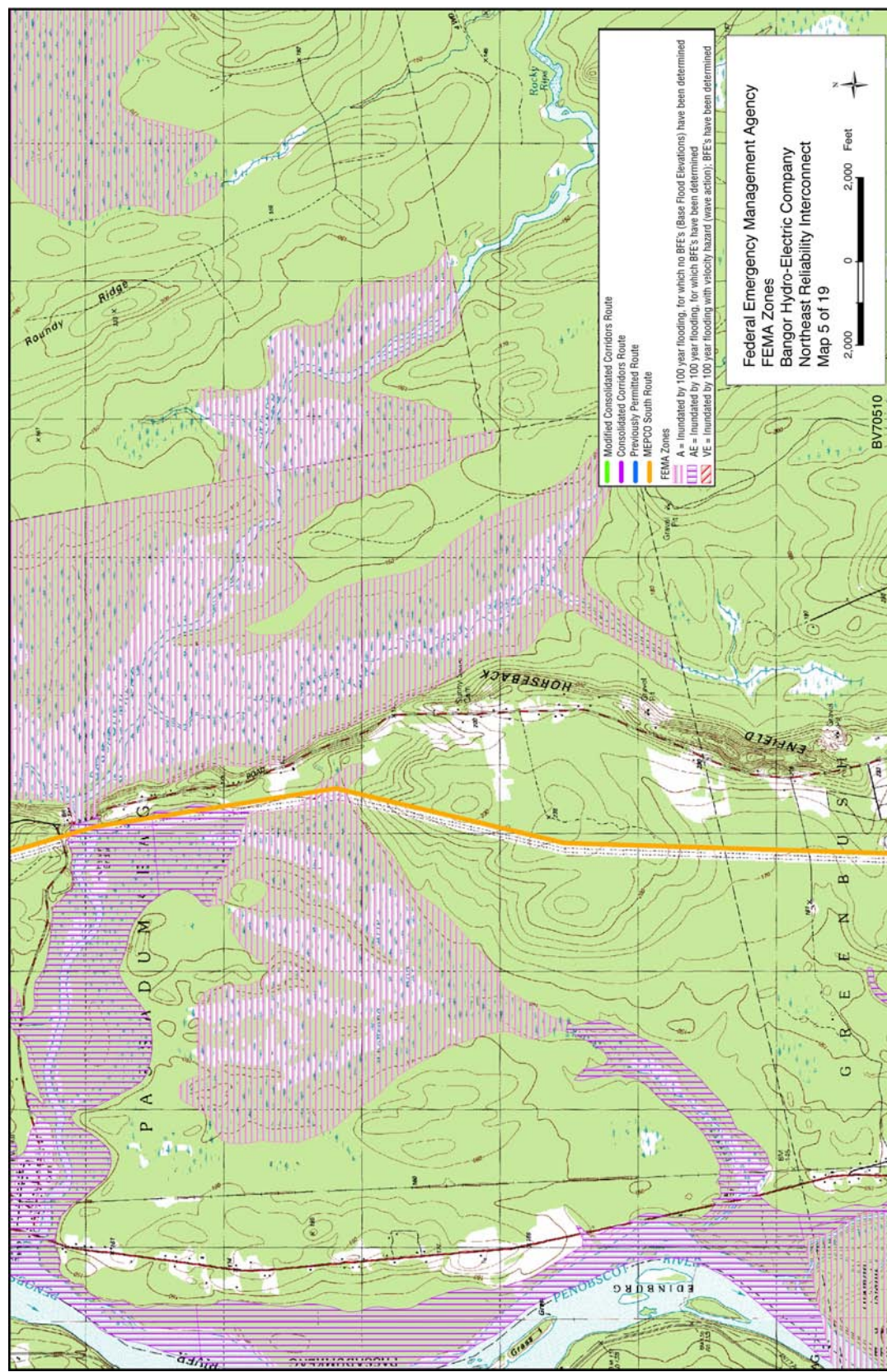


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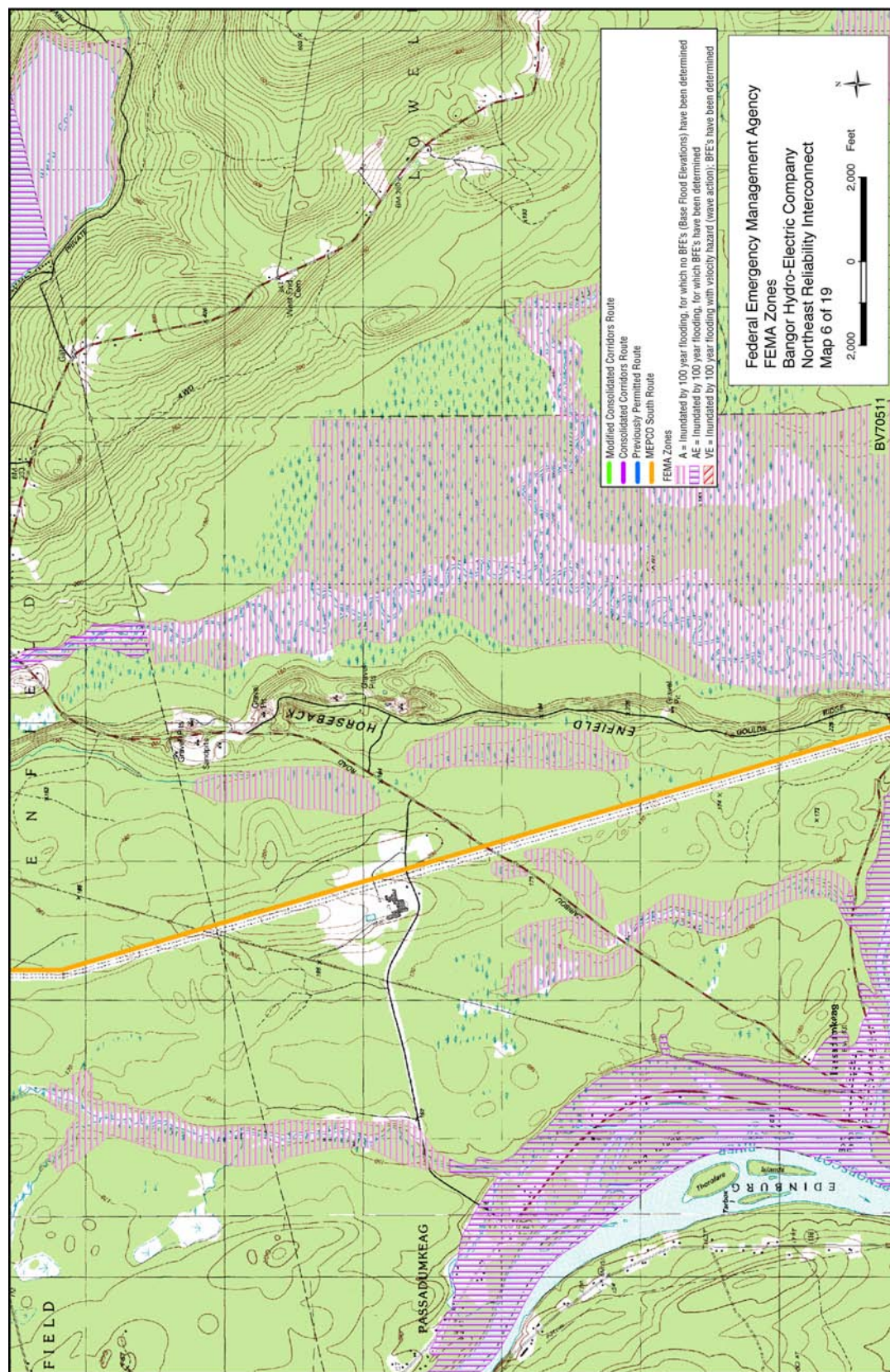


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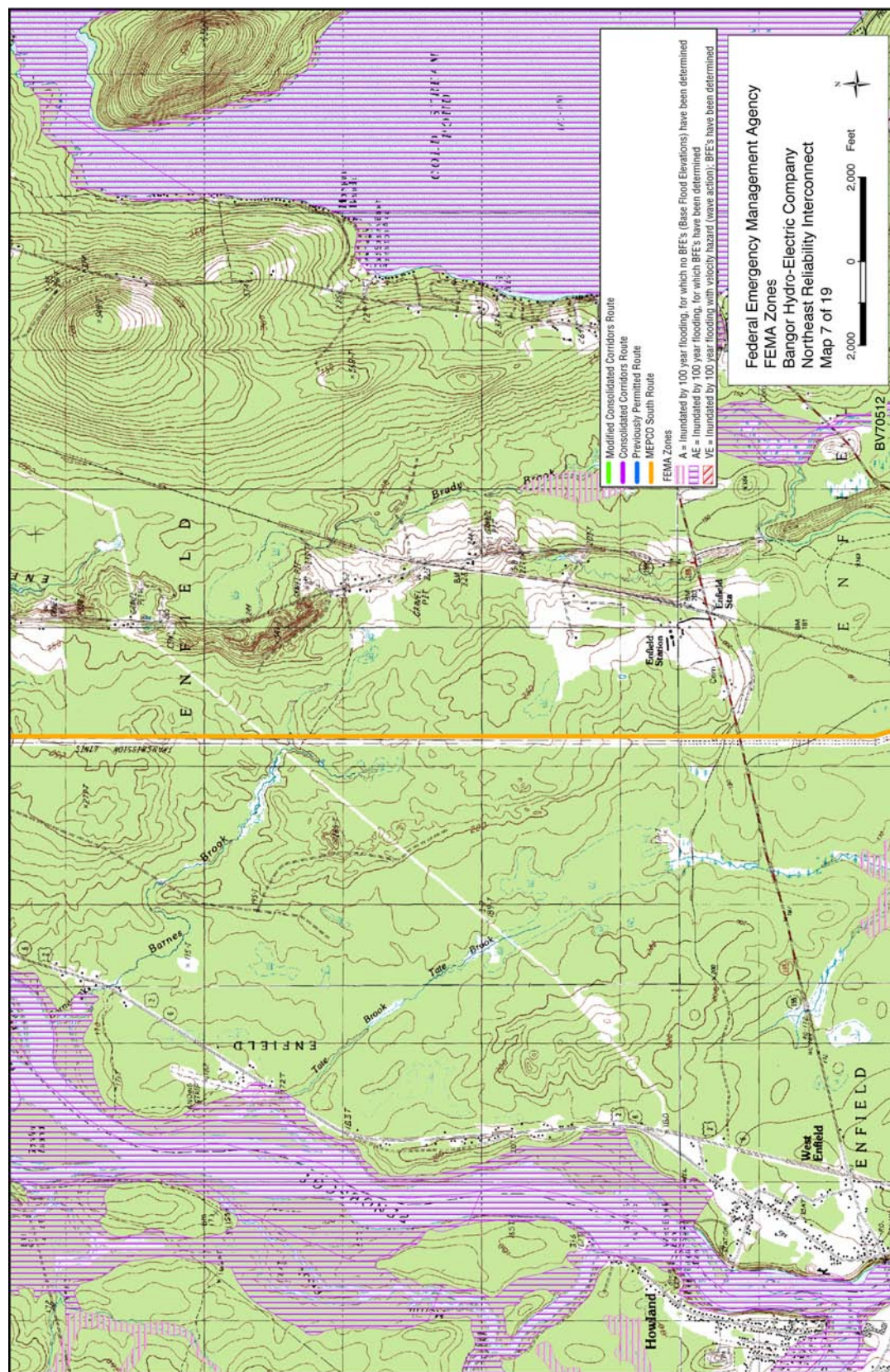


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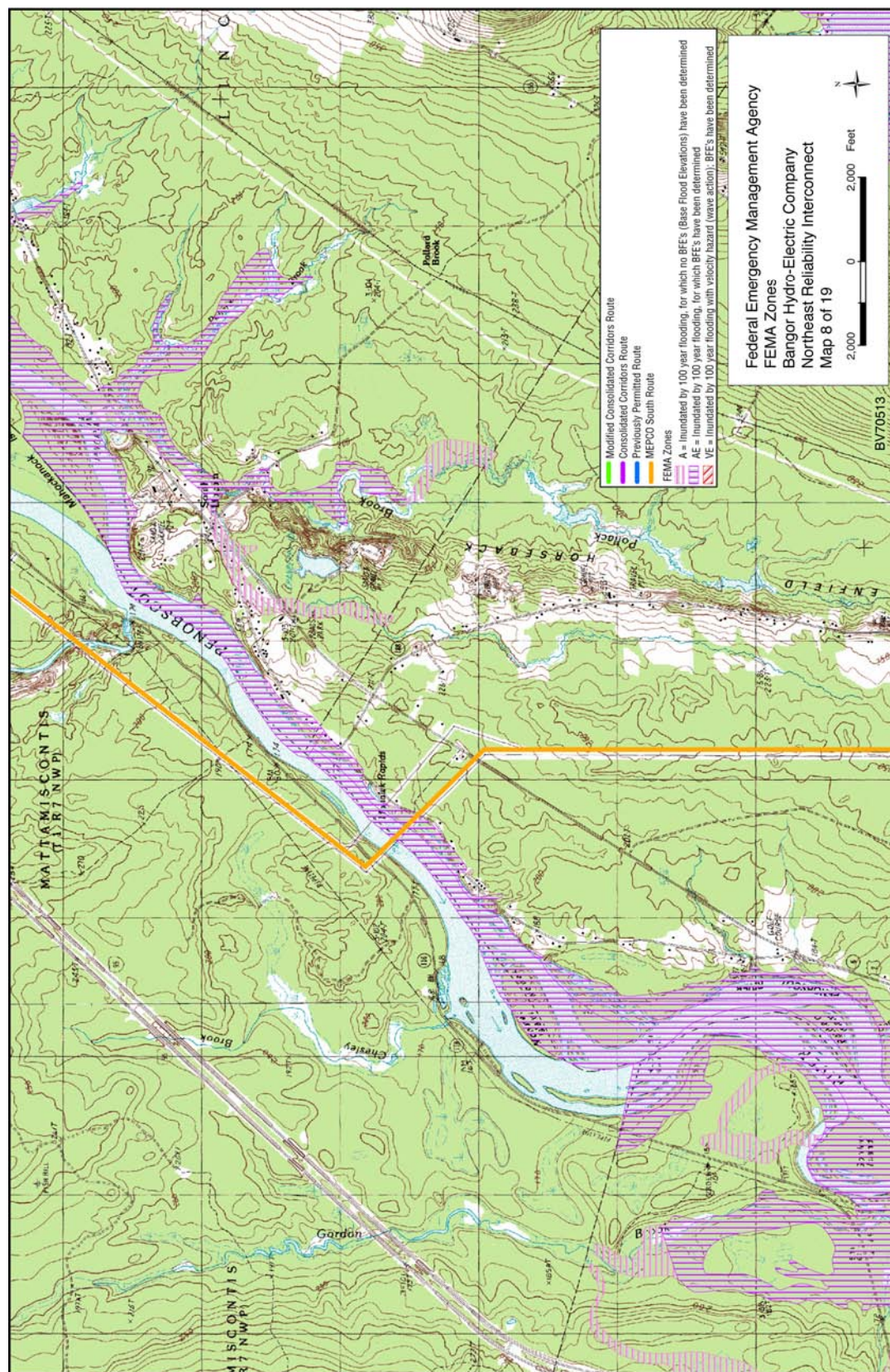


FIGURE ATT1-3h 100-Year Floodplain Areas along the MEPCO South Route (No FEMA data are available for the Land Use Regulation Commission territories) (Cont.)

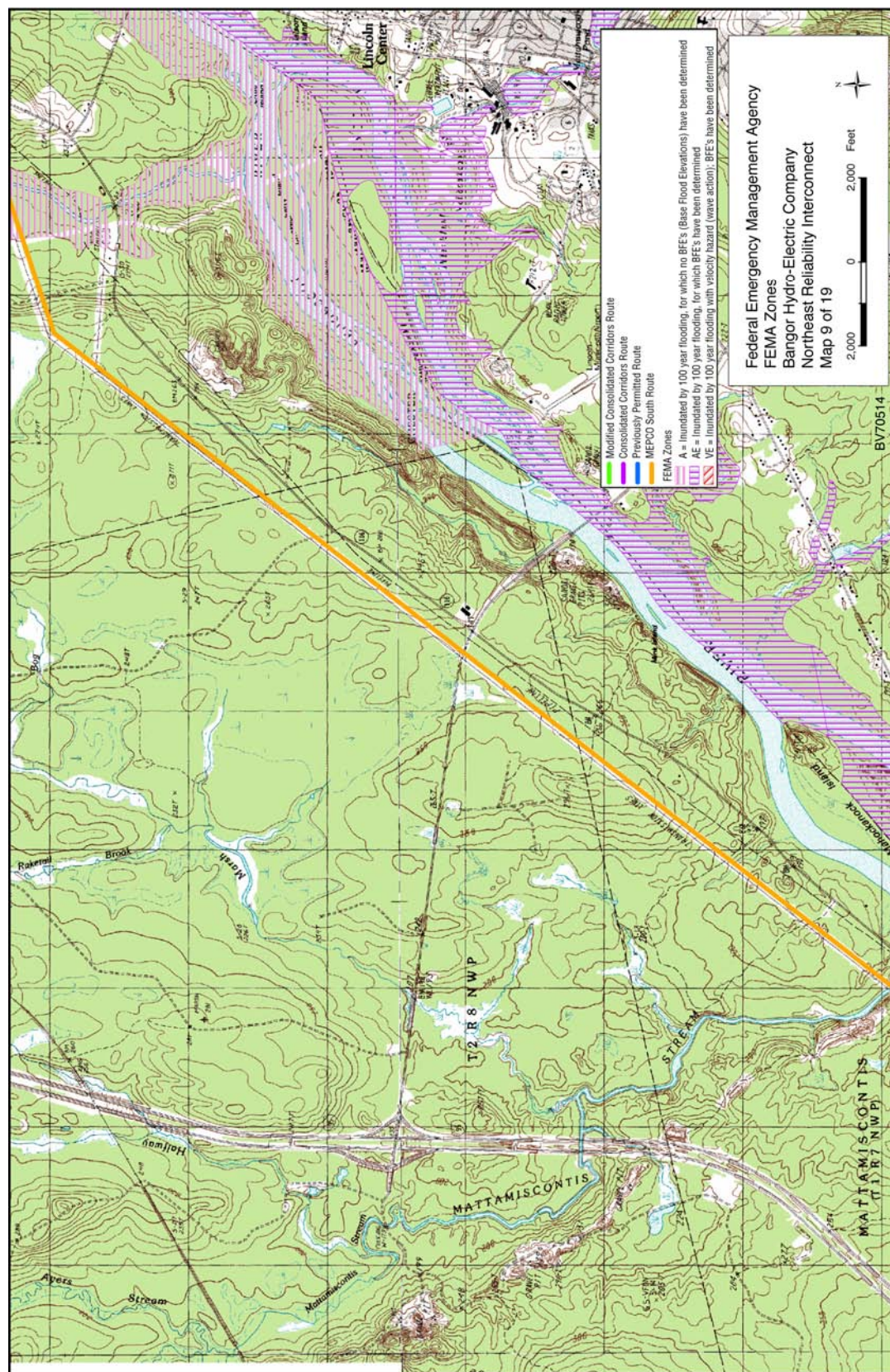


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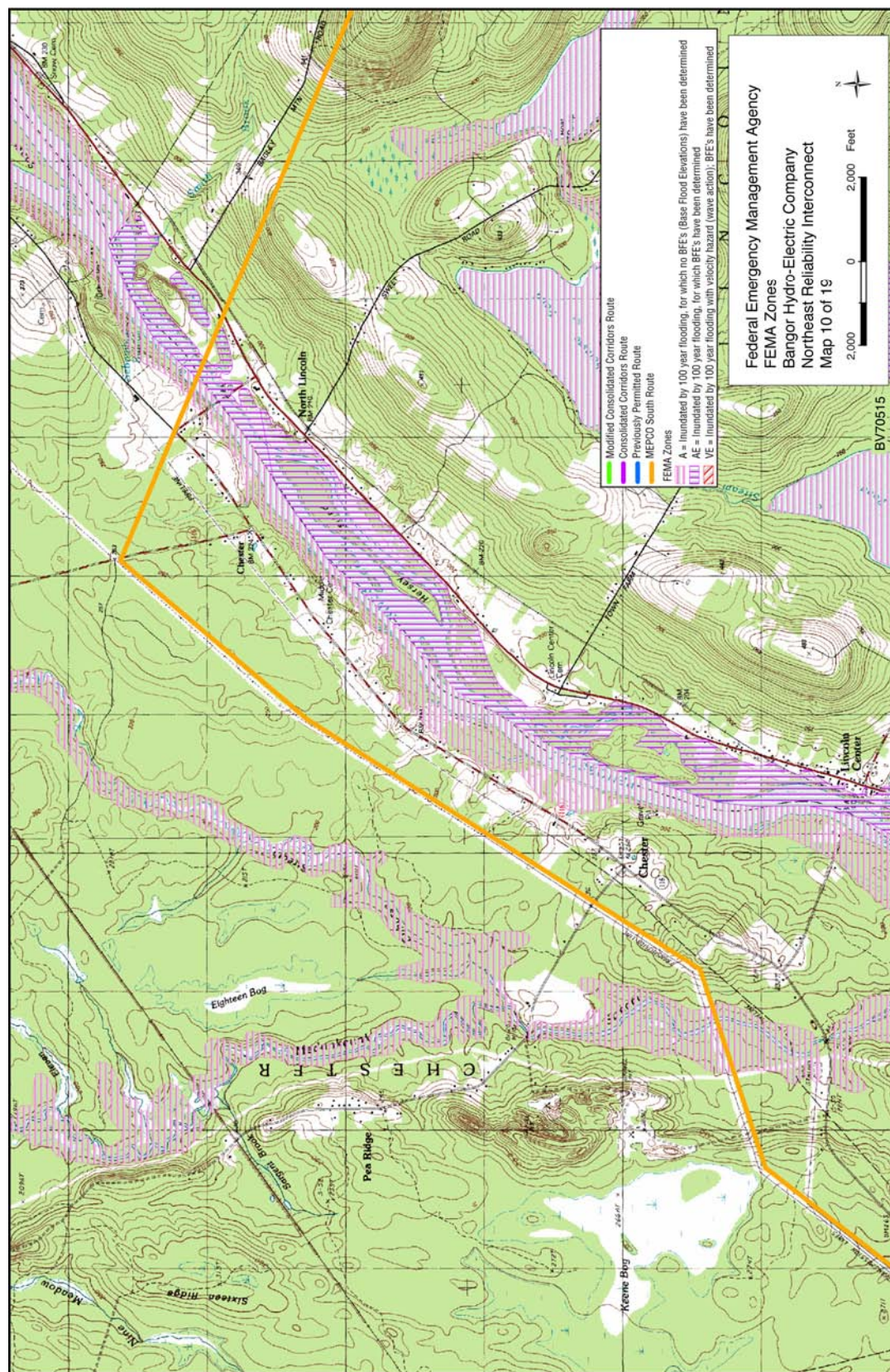


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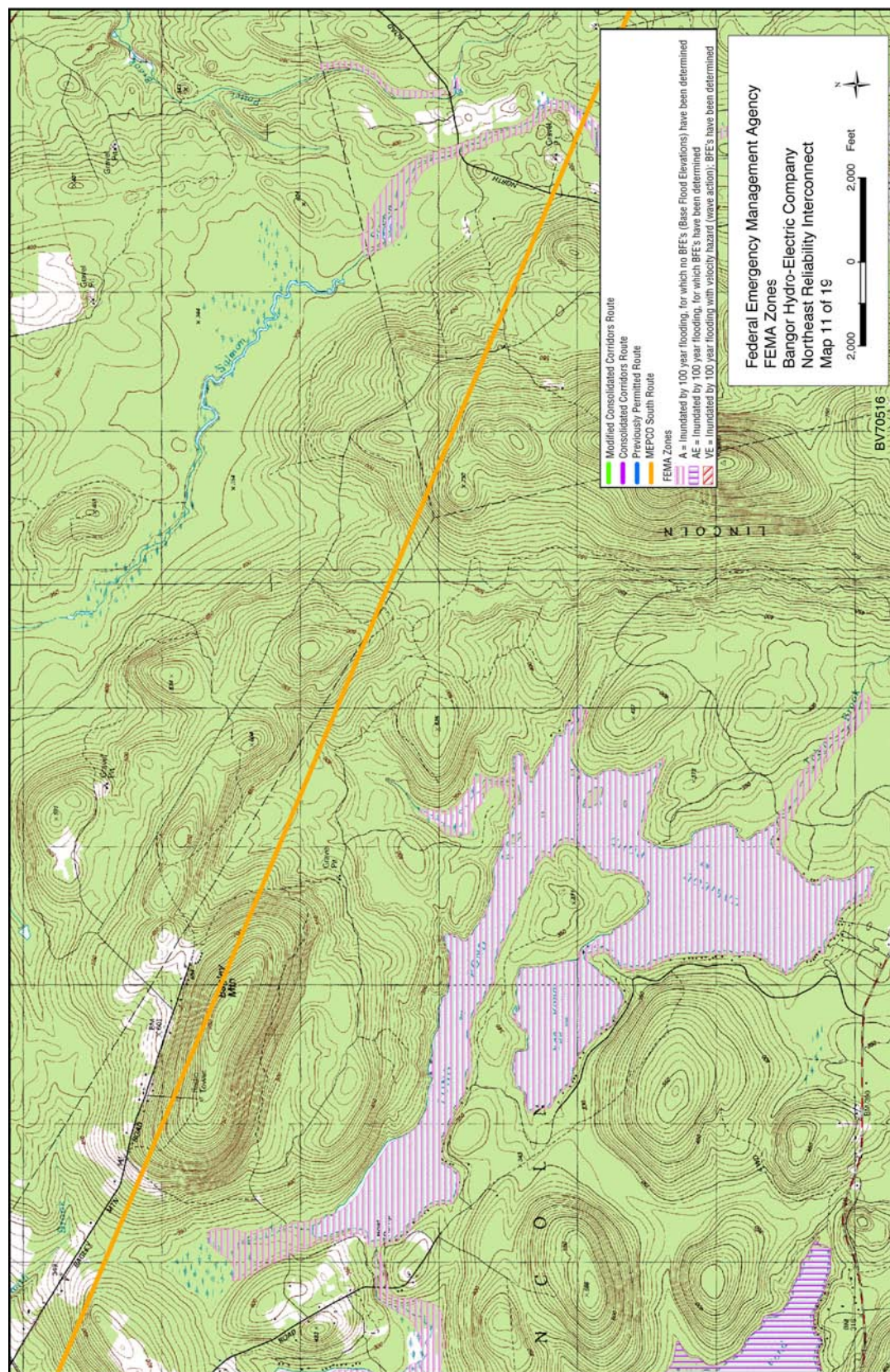


FIGURE ATT1-3k 100-Year Floodplain Areas along the MEPCO South Route (No FEMA data are available for the Land Use Regulation Commission territories) (Cont.)

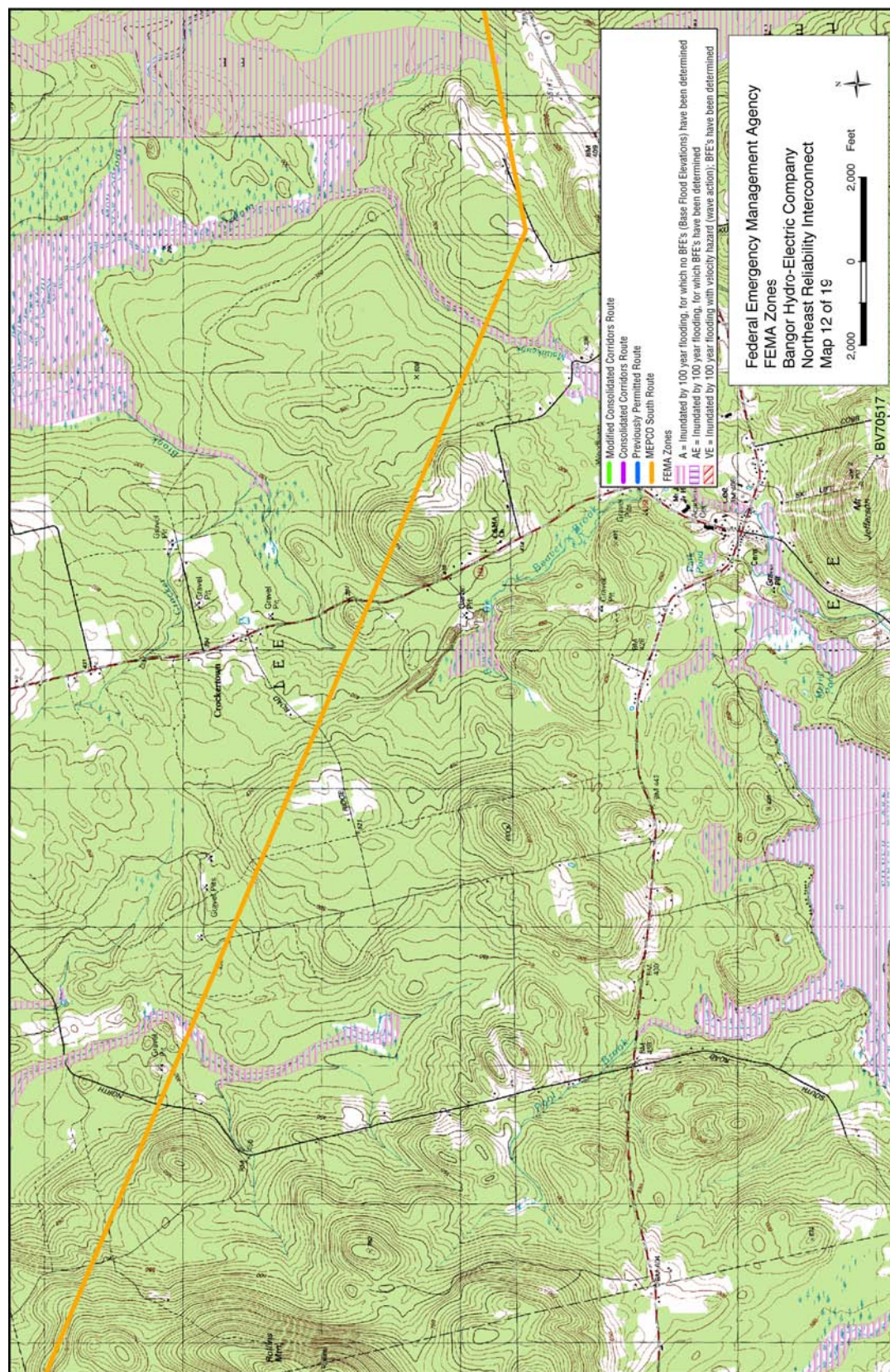


FIGURE ATT1-31 100-Year Floodplain Areas along the MEPCO South Route (Cont.)

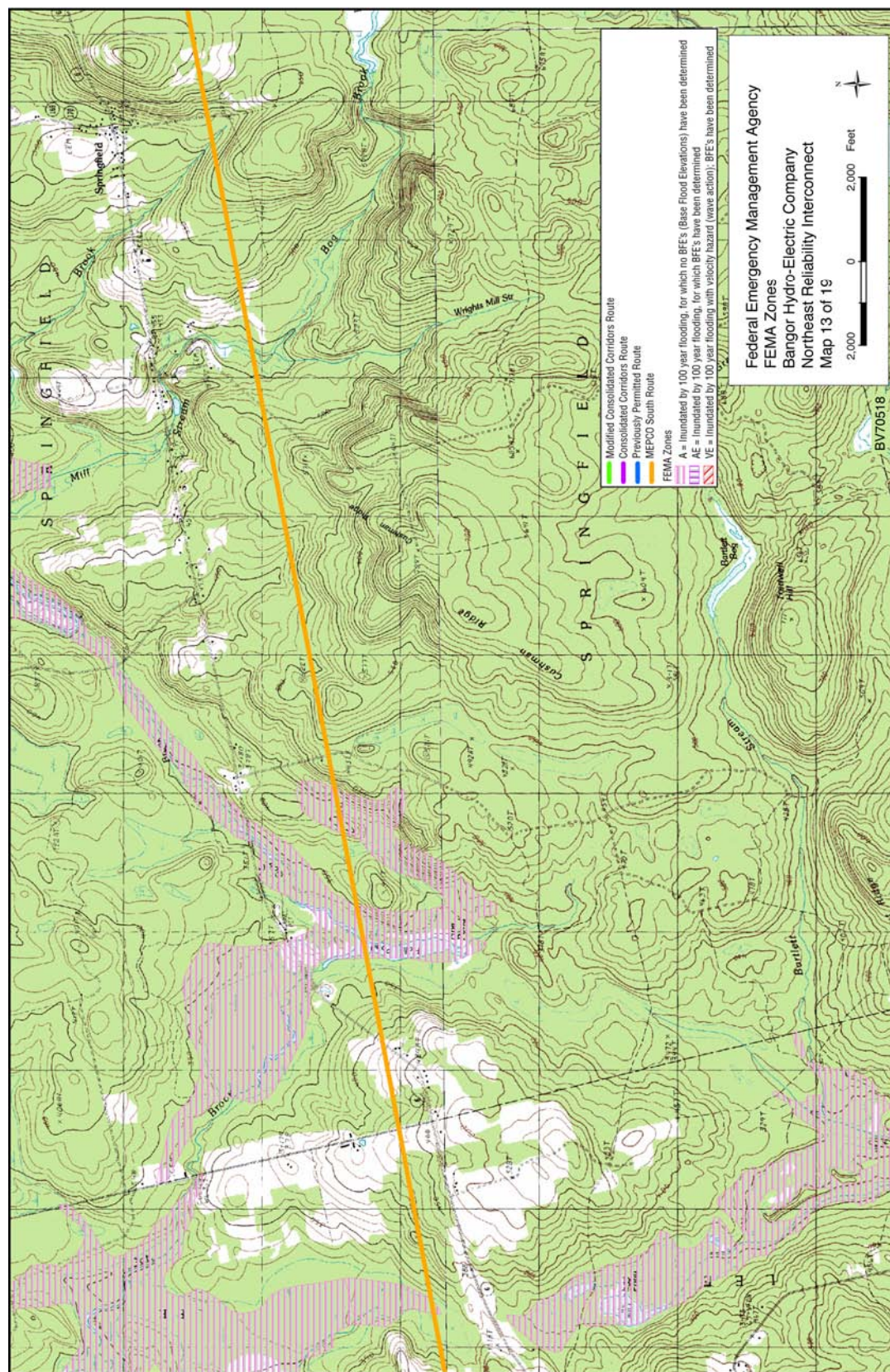


FIGURE ATT1-3m 100-Year Floodplain Areas along the MEPCO South Route (No FEMA data are available for the Land Use Regulation Commission territories) (Cont.)

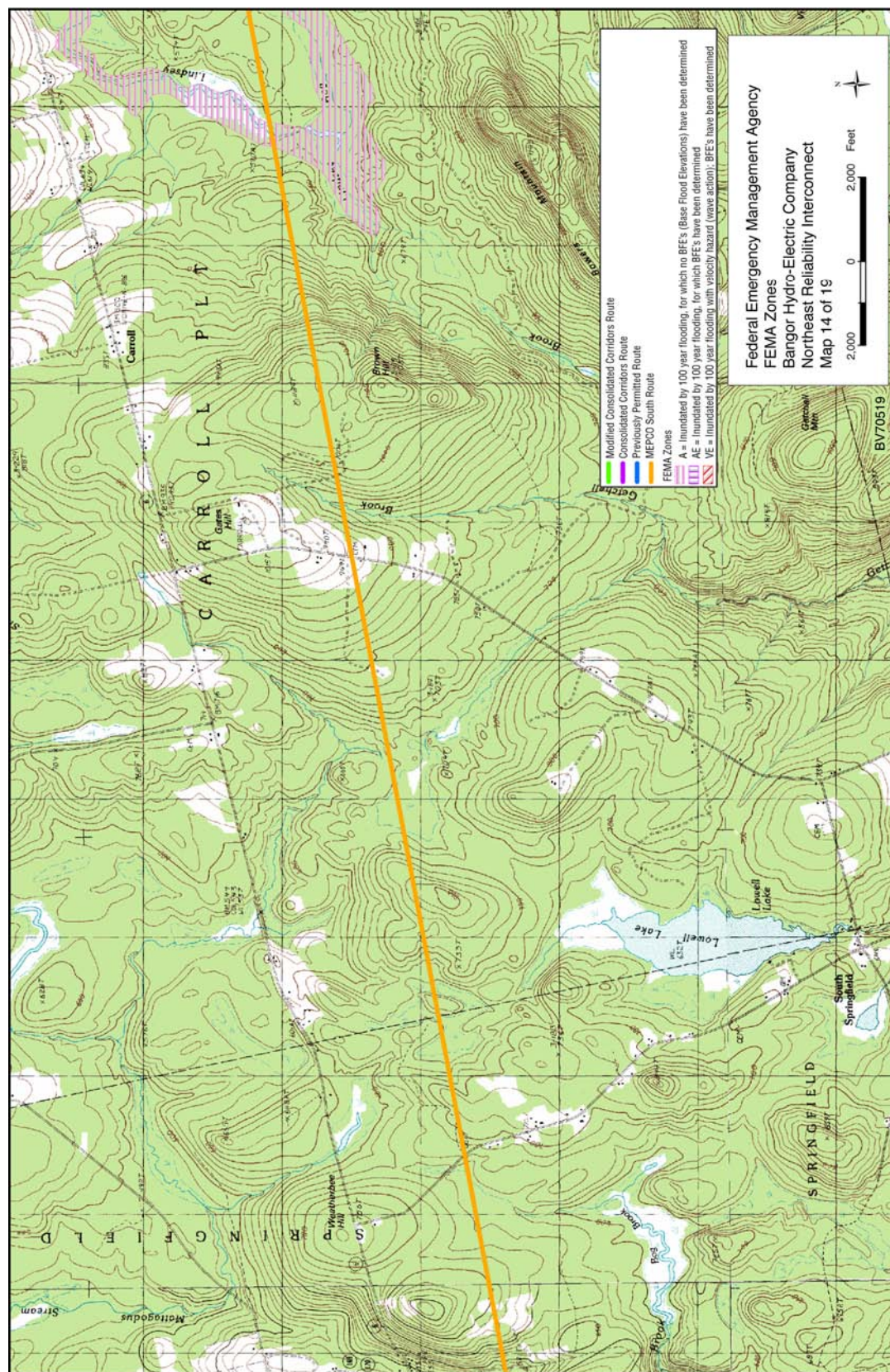


FIGURE ATT1-3n 100-Year Floodplain Areas along the MEPCO South Route (No FEMA data are available for the Land Use Regulation Commission territories) (Cont.)

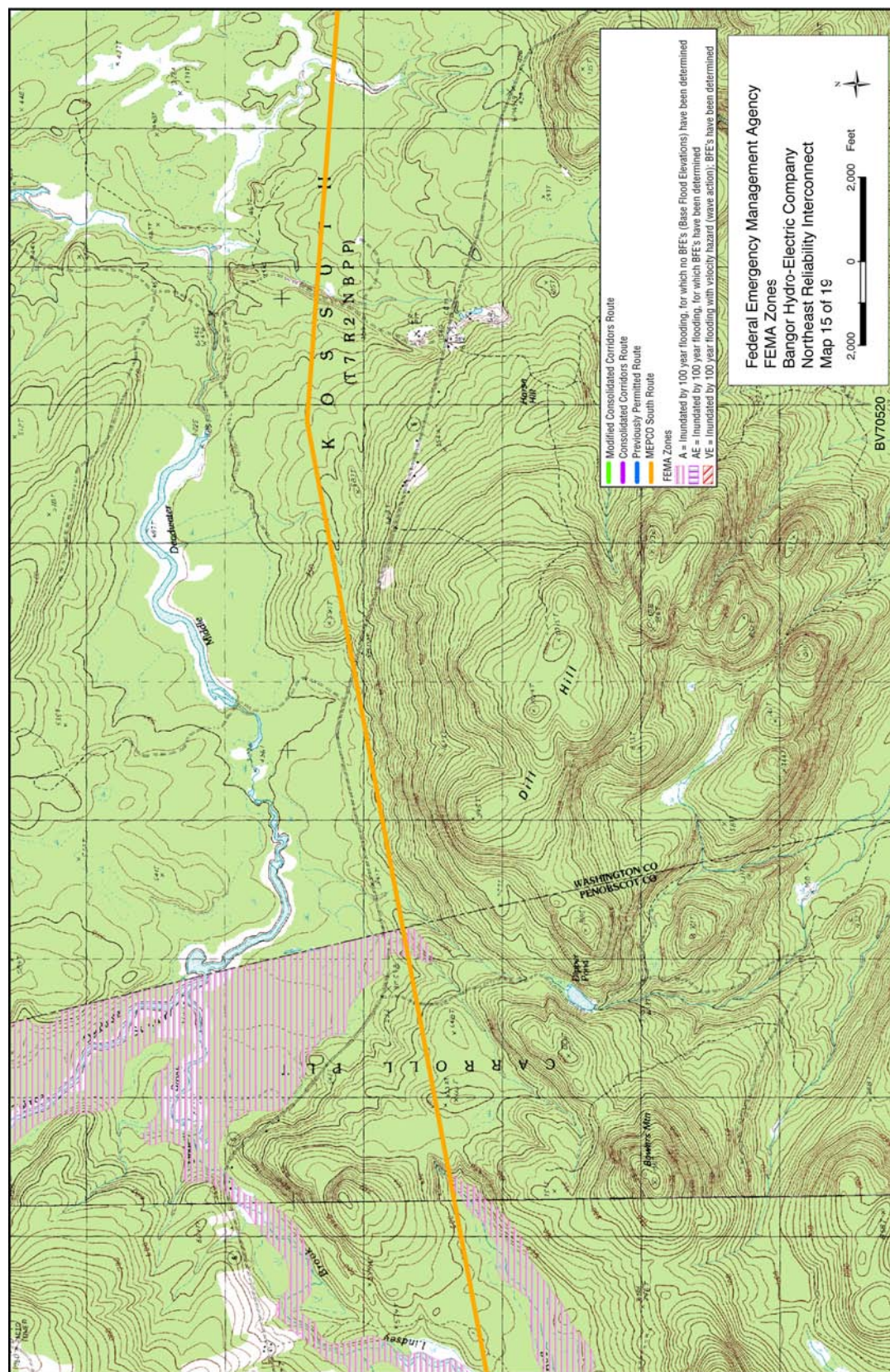


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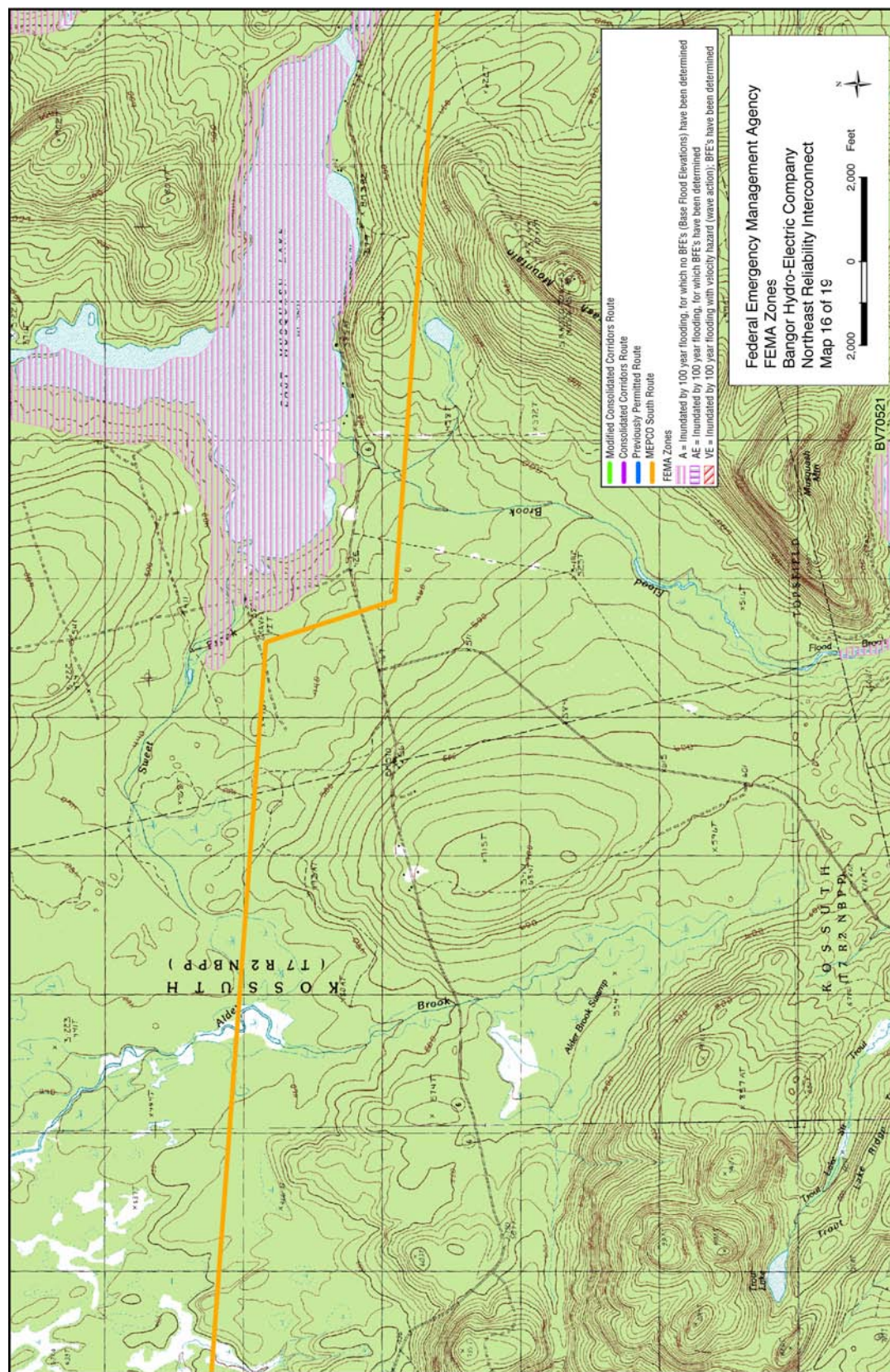


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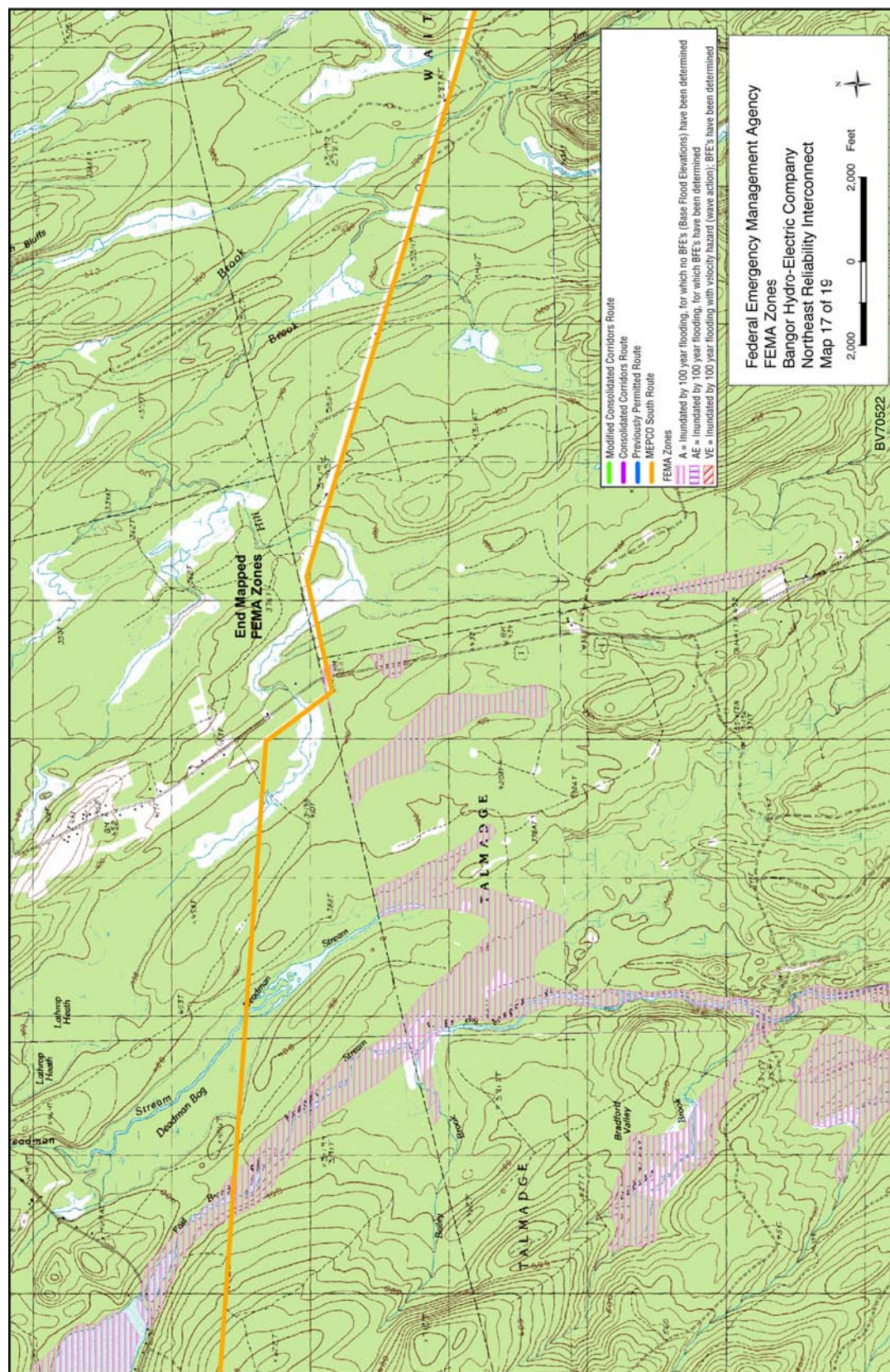


FIGURE ATT1-3q 100-Year Floodplain Areas along the MEPCO South Route (No FEMA data are available for the Land Use Regulation Commission territories) (Cont.)

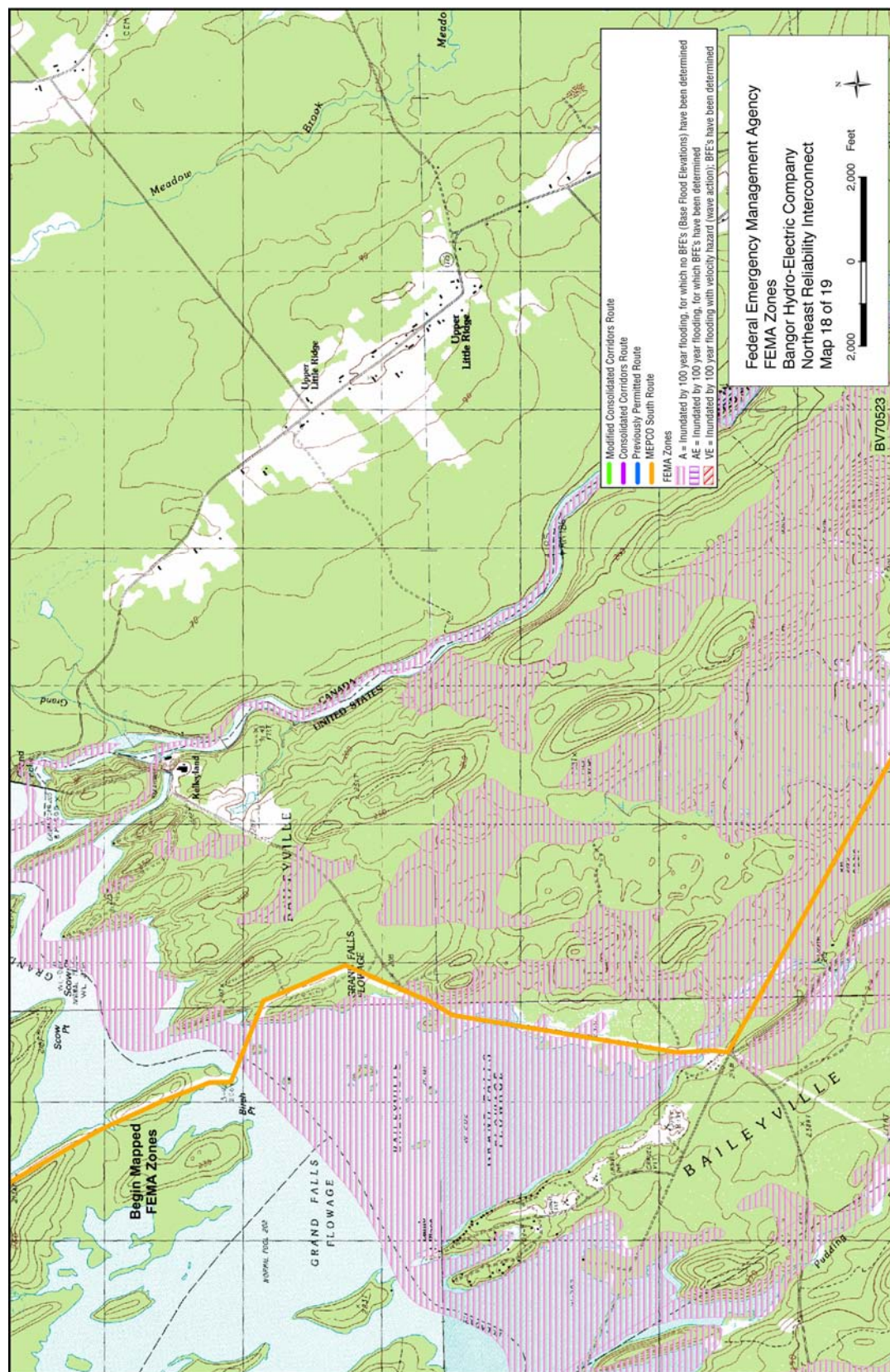


FIGURE ATT1-3r 100-Year Floodplain Areas along the MEPCO South Route (No FEMA data are available for the Land Use Regulation Commission territories) (Cont.)

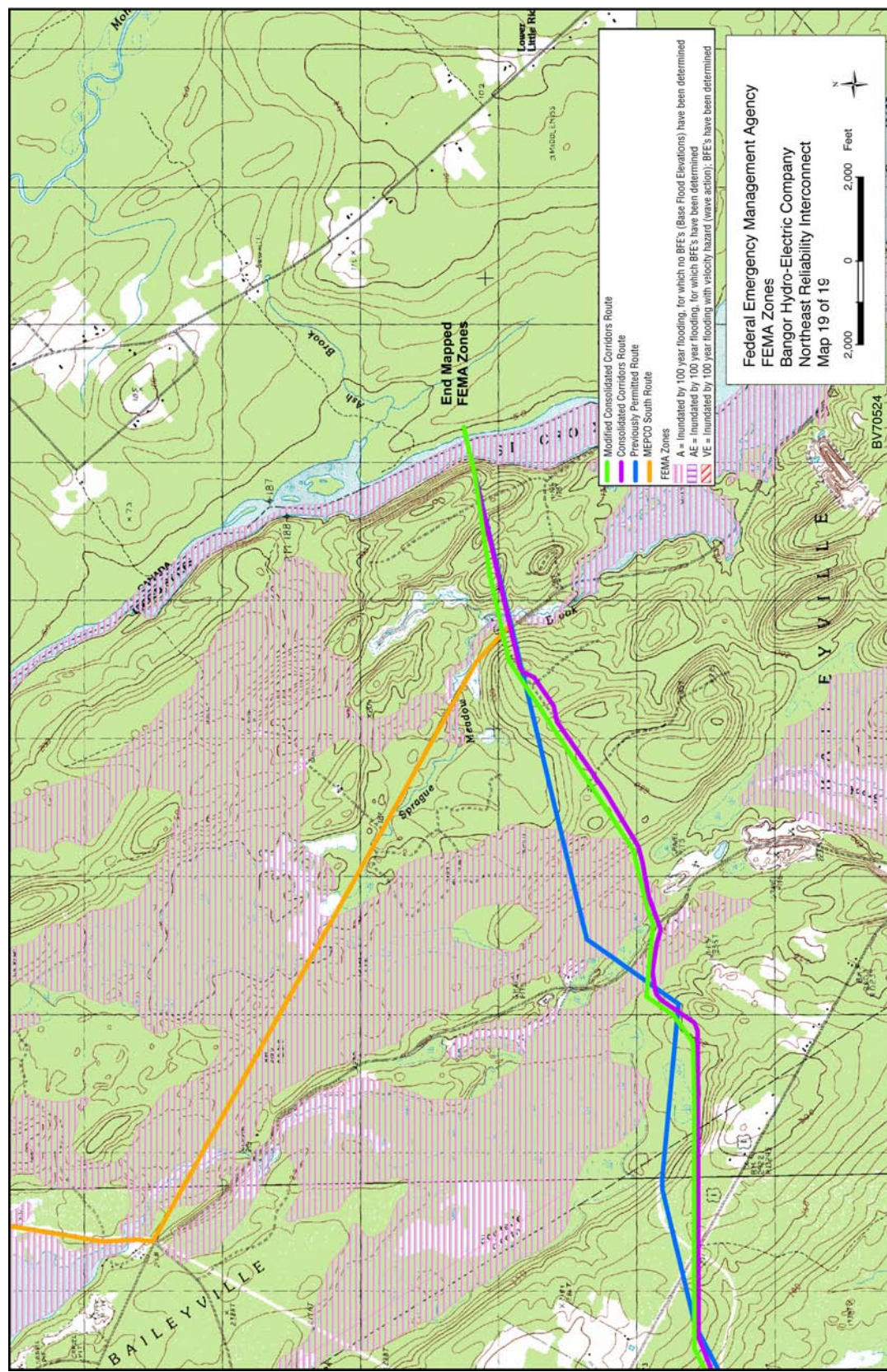


FIGURE ATT1-3s 100-Year Floodplain Areas along the MEPCO South Route (Cont.)

ATTACHMENT 2:

**WETLAND MAPS FOR THE BANGOR HYDRO-ELECTRIC COMPANY
NORTHEAST RELIABILITY INTERCONNECT ALTERNATIVE ROUTES**

ATTACHMENT 2:**WETLAND MAPS FOR THE BANGOR HYDRO-ELECTRIC COMPANY
NORTHEAST RELIABILITY INTERCONNECT ALTERNATIVE ROUTES**

This attachment shows the locations of wetlands within 1 mi (1.6 km) on either side of the alternative routes. (Some wetlands that extend beyond 1 mi [1.6 km] are therefore depicted incompletely.) Wetlands along the Modified Consolidated Corridors Route are shown in Figures ATT2-1a through ATT2-1n. For the Consolidated Corridors Route, only the wetlands along the Pickerel Pond Reroute area (between Blackman Stream and Stud Mill Road) are shown (Figures ATT2-2a through ATT2-2c). No wetlands occur within the Myra Camps Reroute, and all other portions of the Consolidated Corridors Route are identical to the Modified Consolidated Corridors Route. Wetlands along the Previously Permitted Route are shown in Figures ATT2-3a through ATT2-3n; wetlands along the MEPCO South Route are shown in Figures ATT2-4a through ATT2-4x.

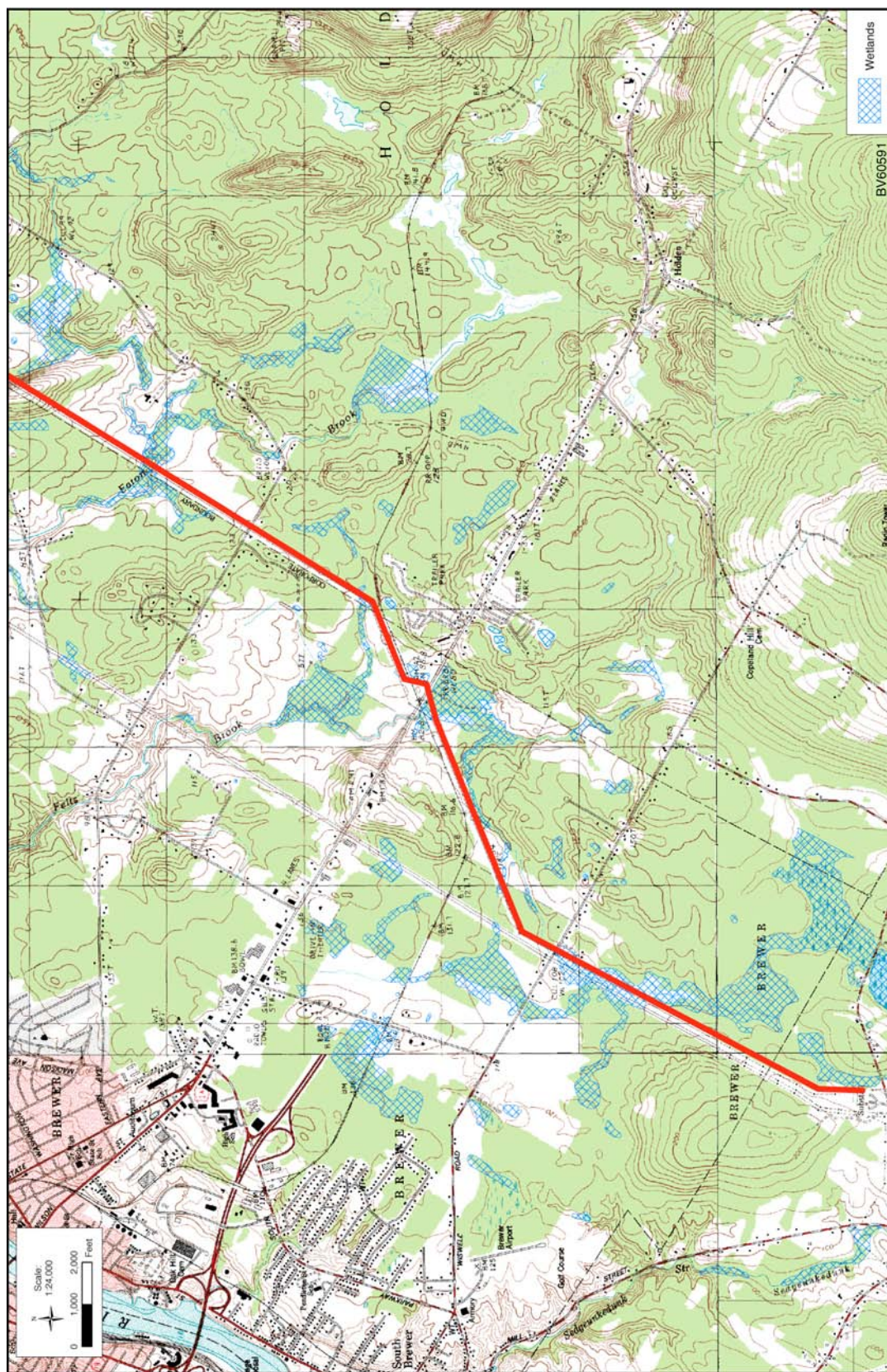


FIGURE ATT2-1a Wetlands along the Modified Consolidated Corridors Route (Source: Paquette 2005c, based on information from National Wetlands Inventory)

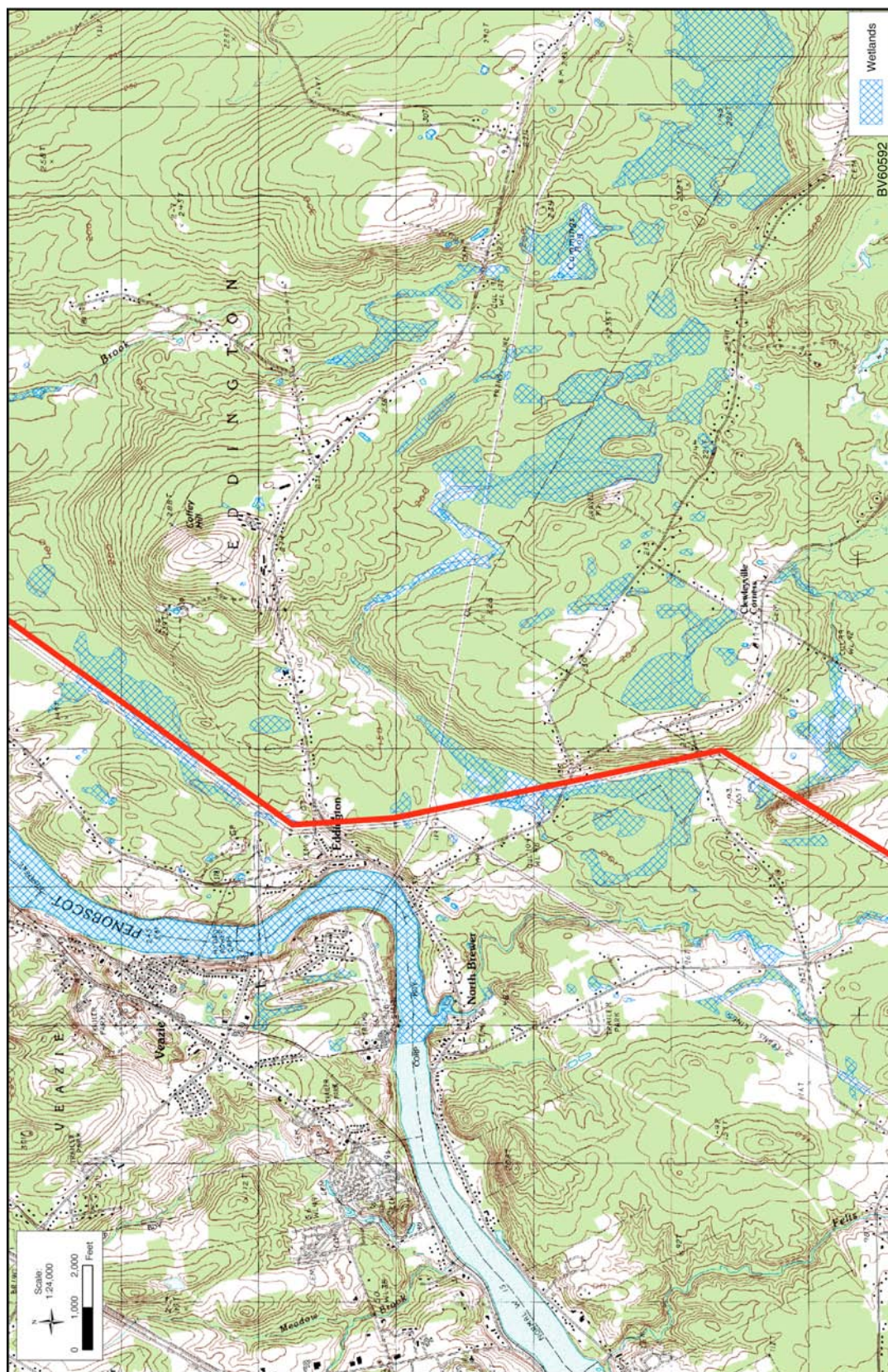


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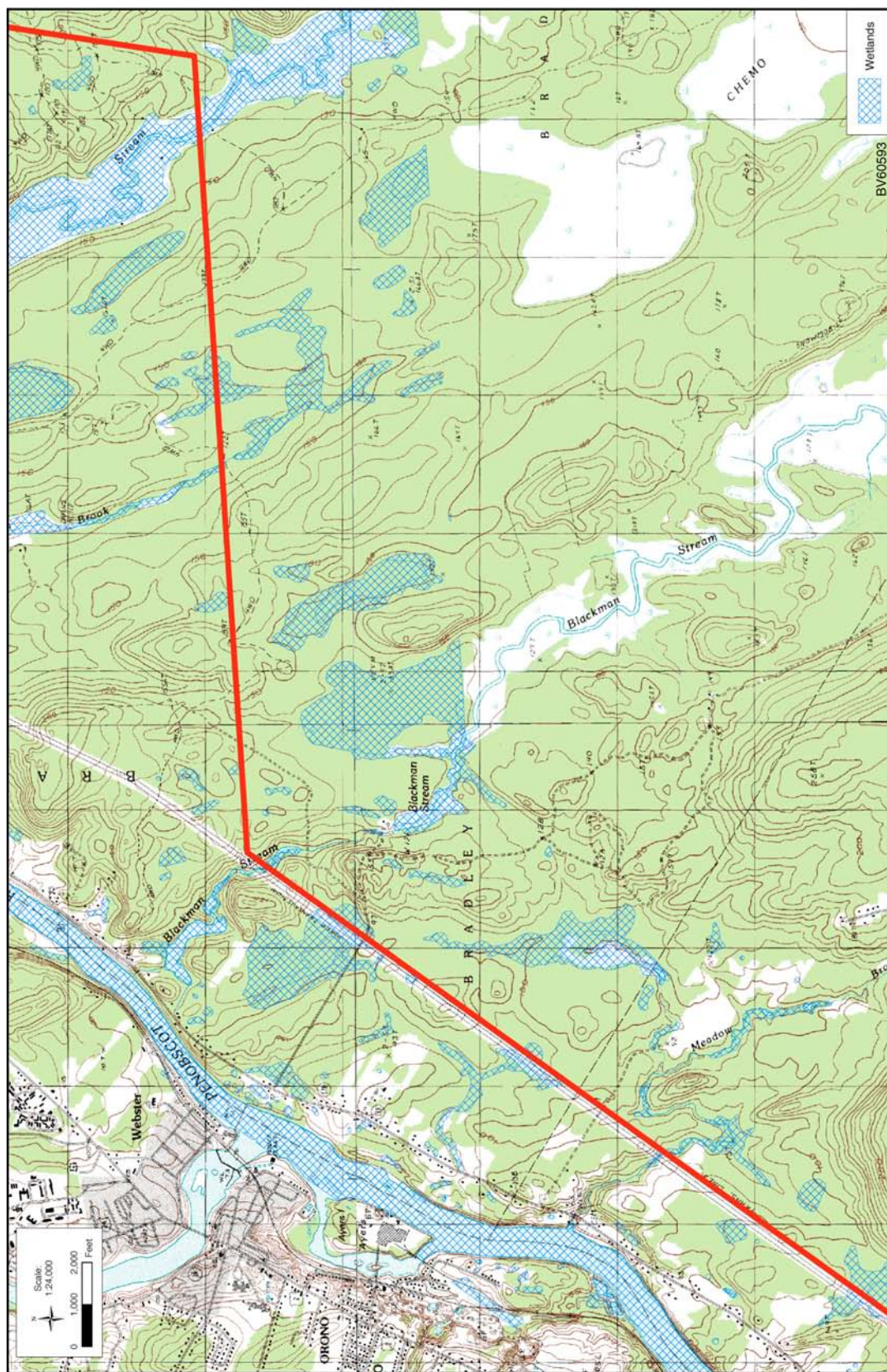


FIGURE ATT2-1c Wetlands along the Modified Consolidated Corridors Route (Cont.)

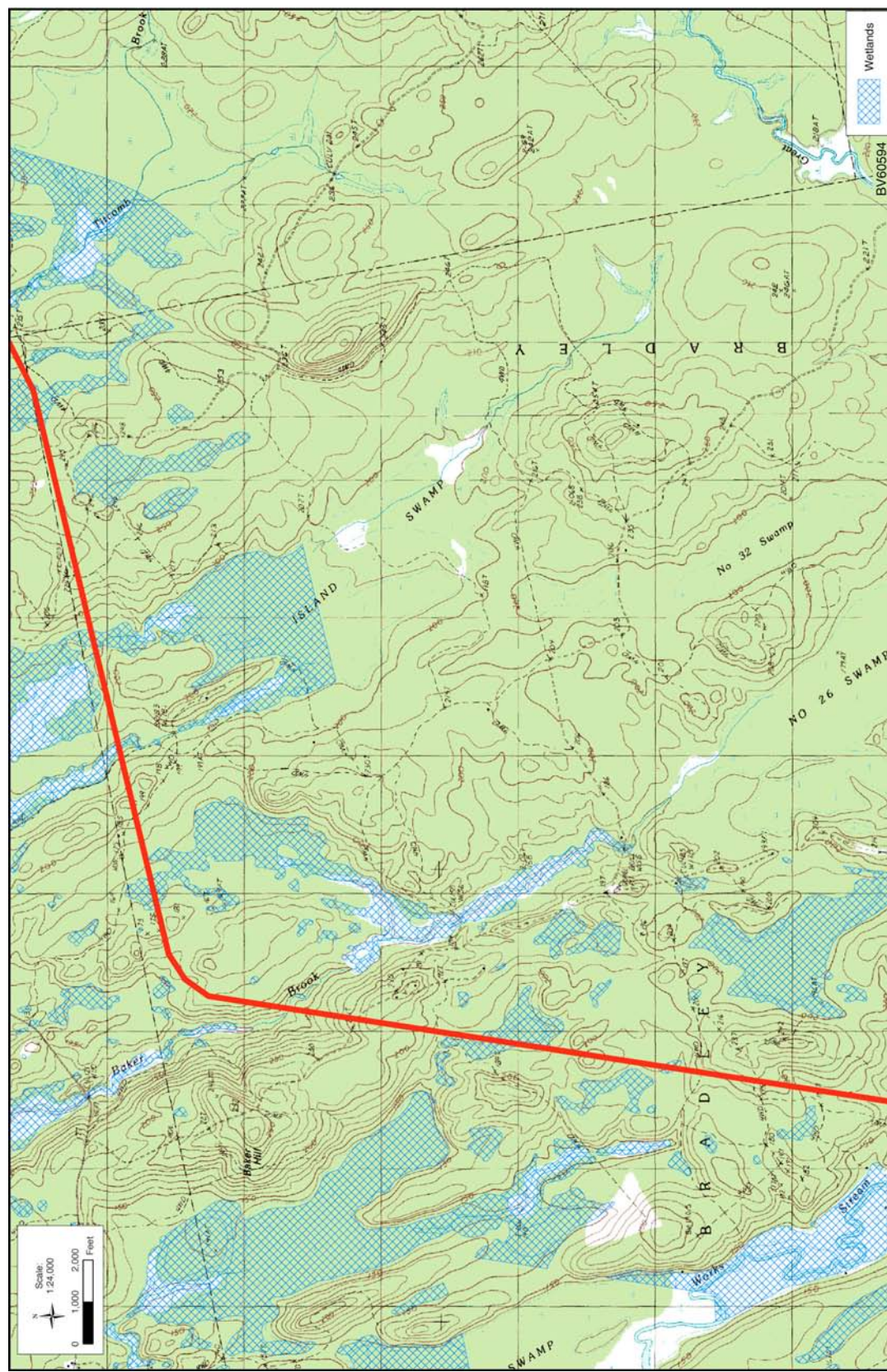


FIGURE ATT2-1d Wetlands along the Modified Consolidated Corridors Route (Cont.)

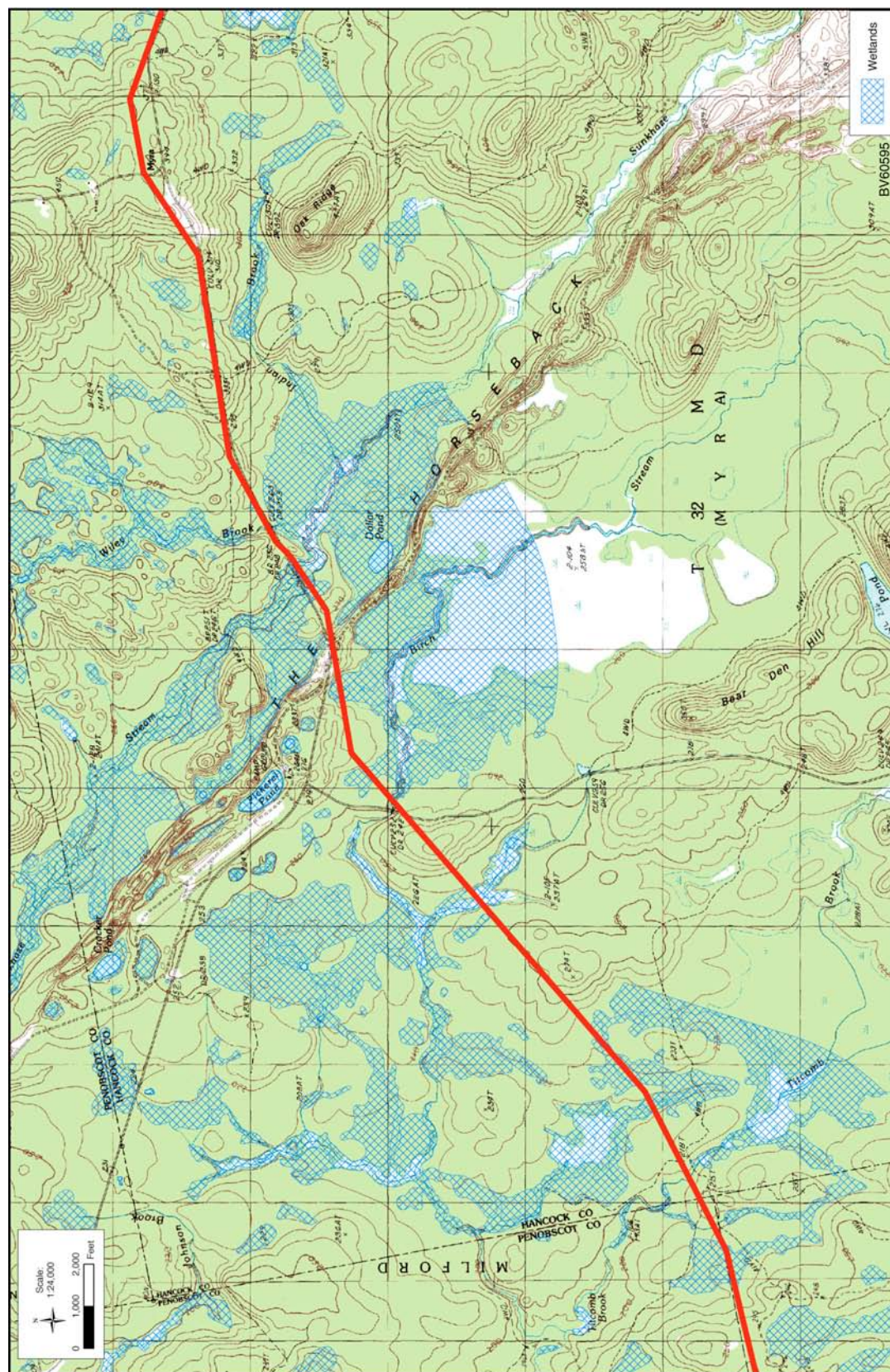


FIGURE ATT2-1e Wetlands along the Modified Consolidated Corridors Route (Cont.)



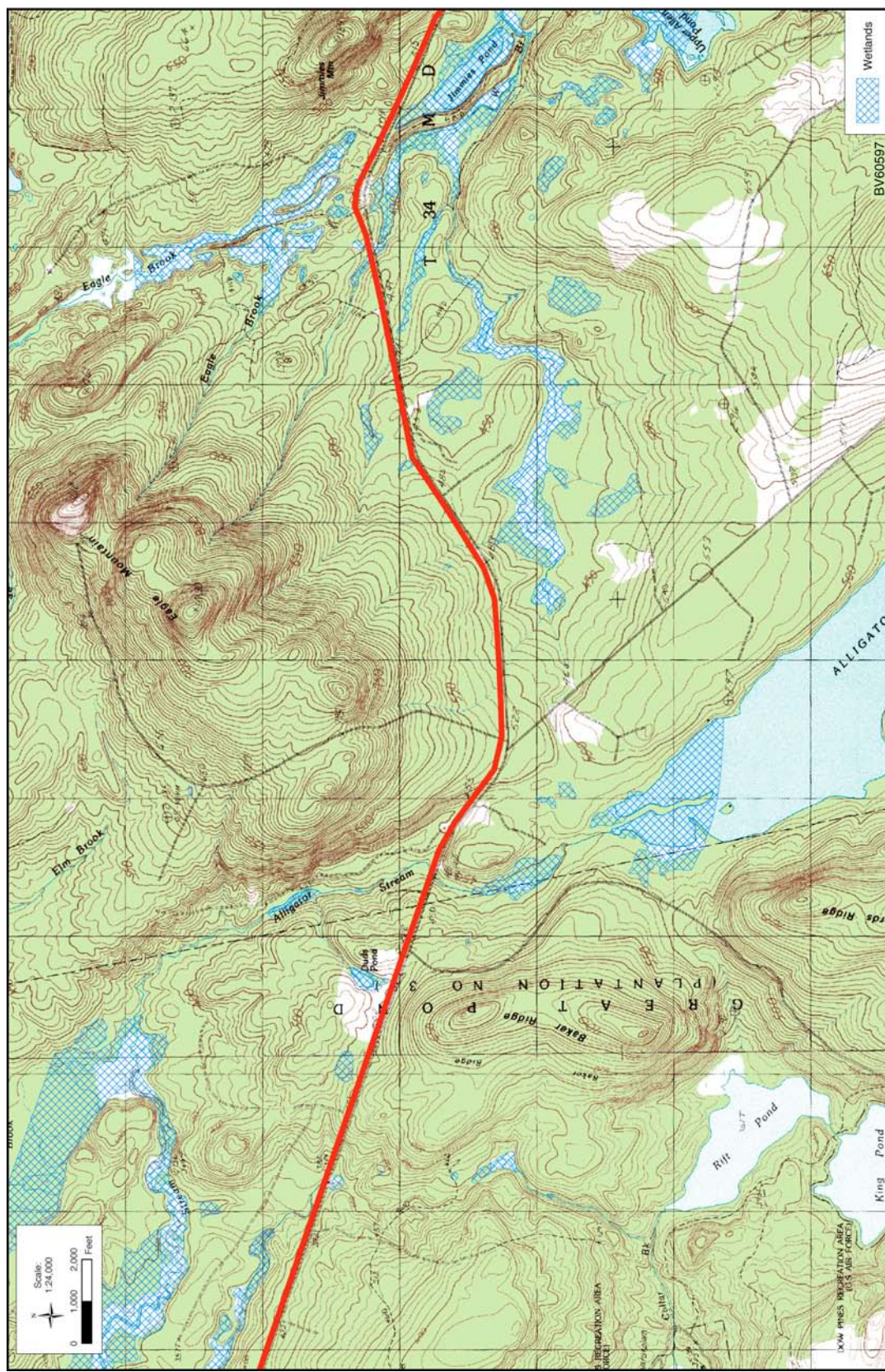


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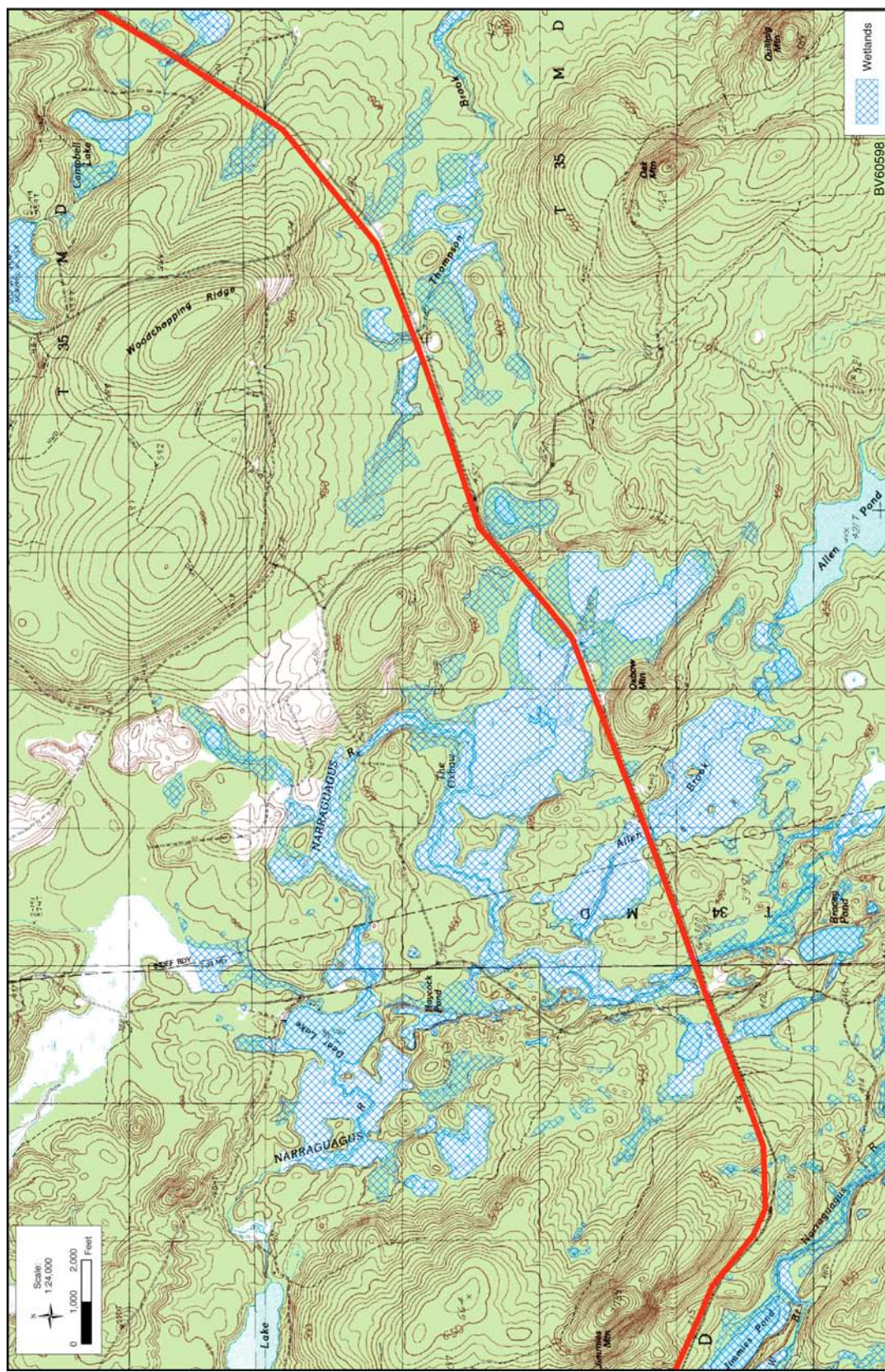


FIGURE ATT2-1h Wetlands along the Modified Consolidated Corridors Route (Cont.)

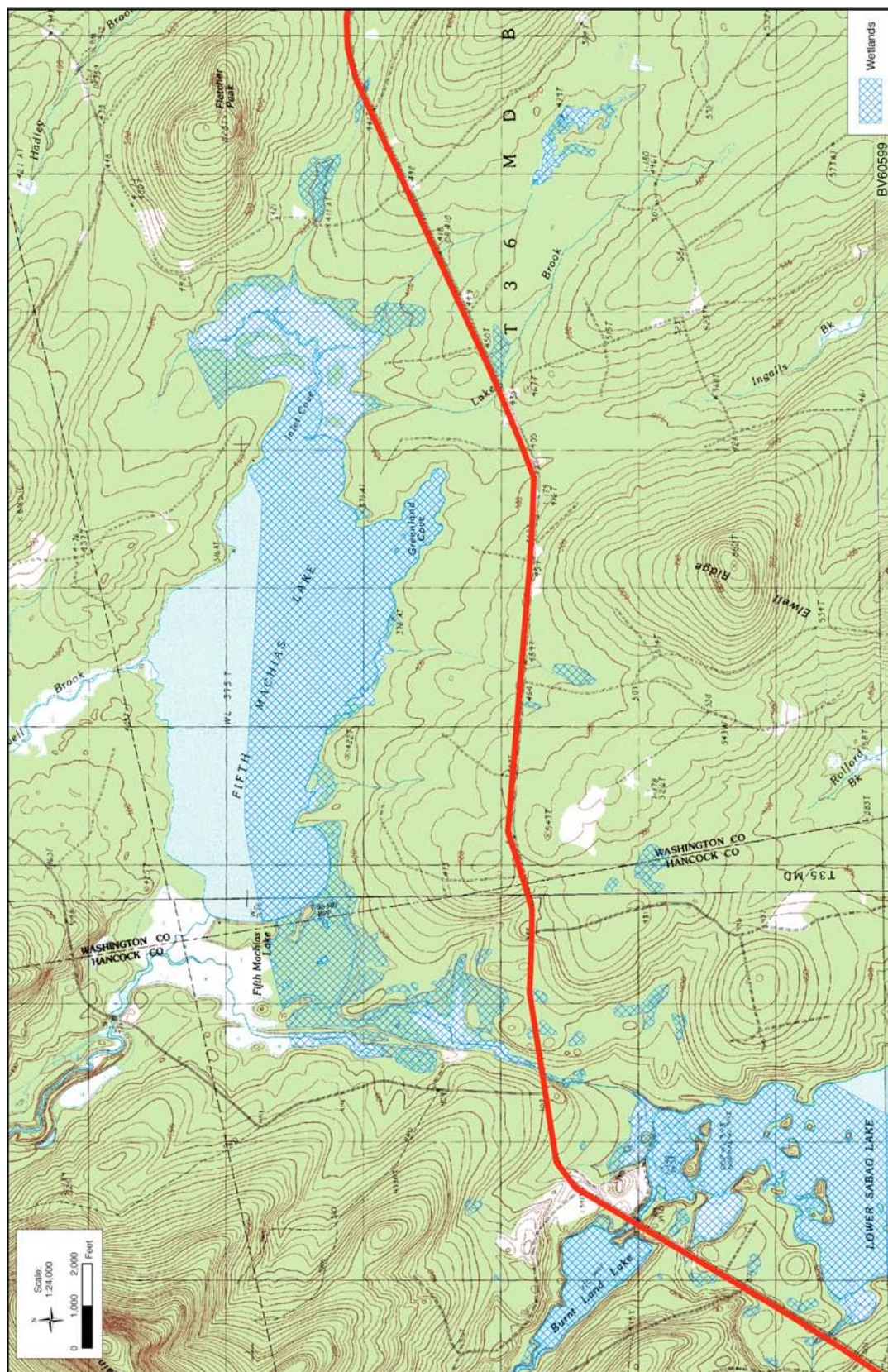


FIGURE ATT2-1i Wetlands along the Modified Consolidated Corridors Route (Cont.)

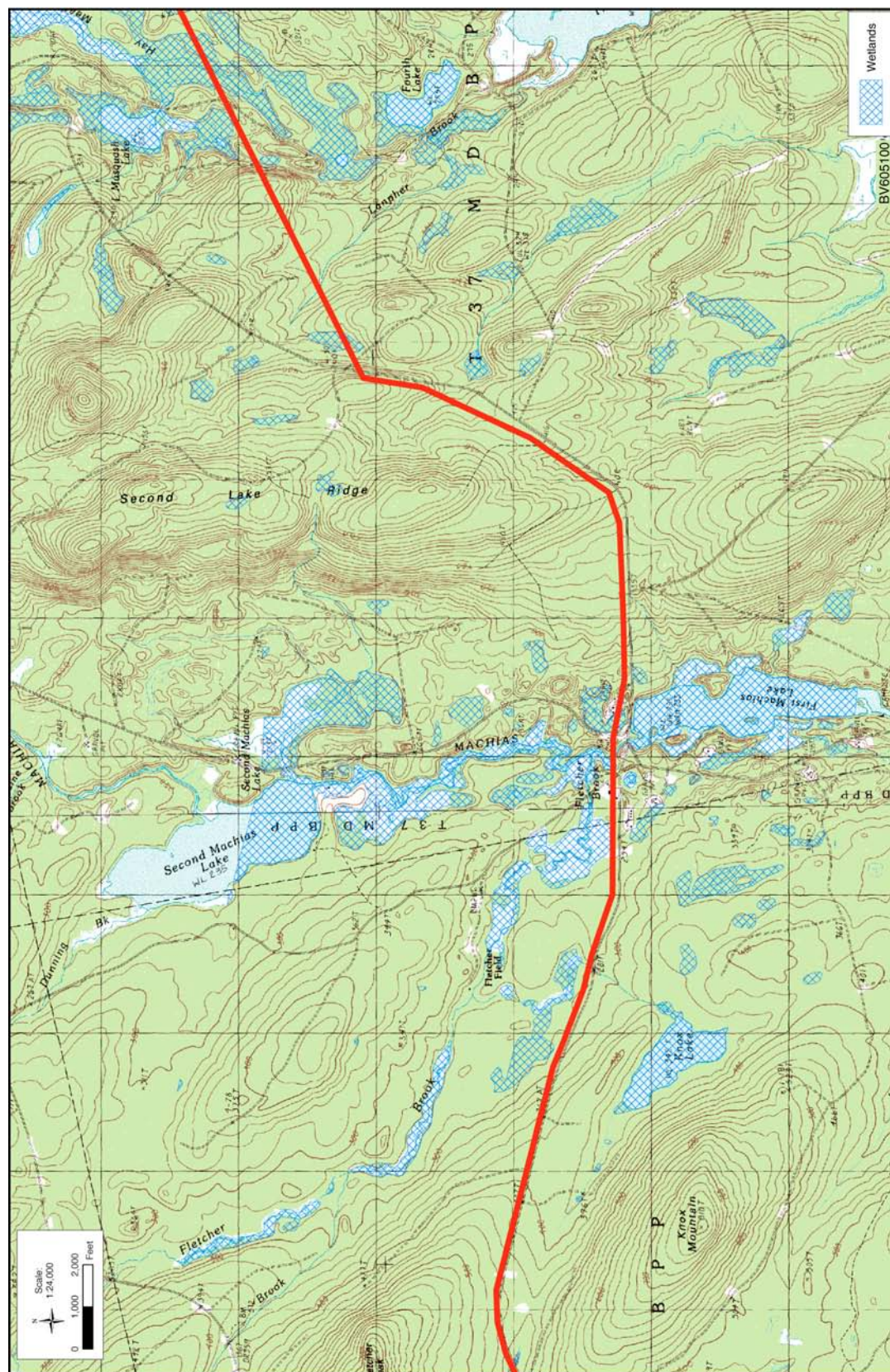


FIGURE ATT2-1j Wetlands along the Modified Consolidated Corridors Route (Cont.)

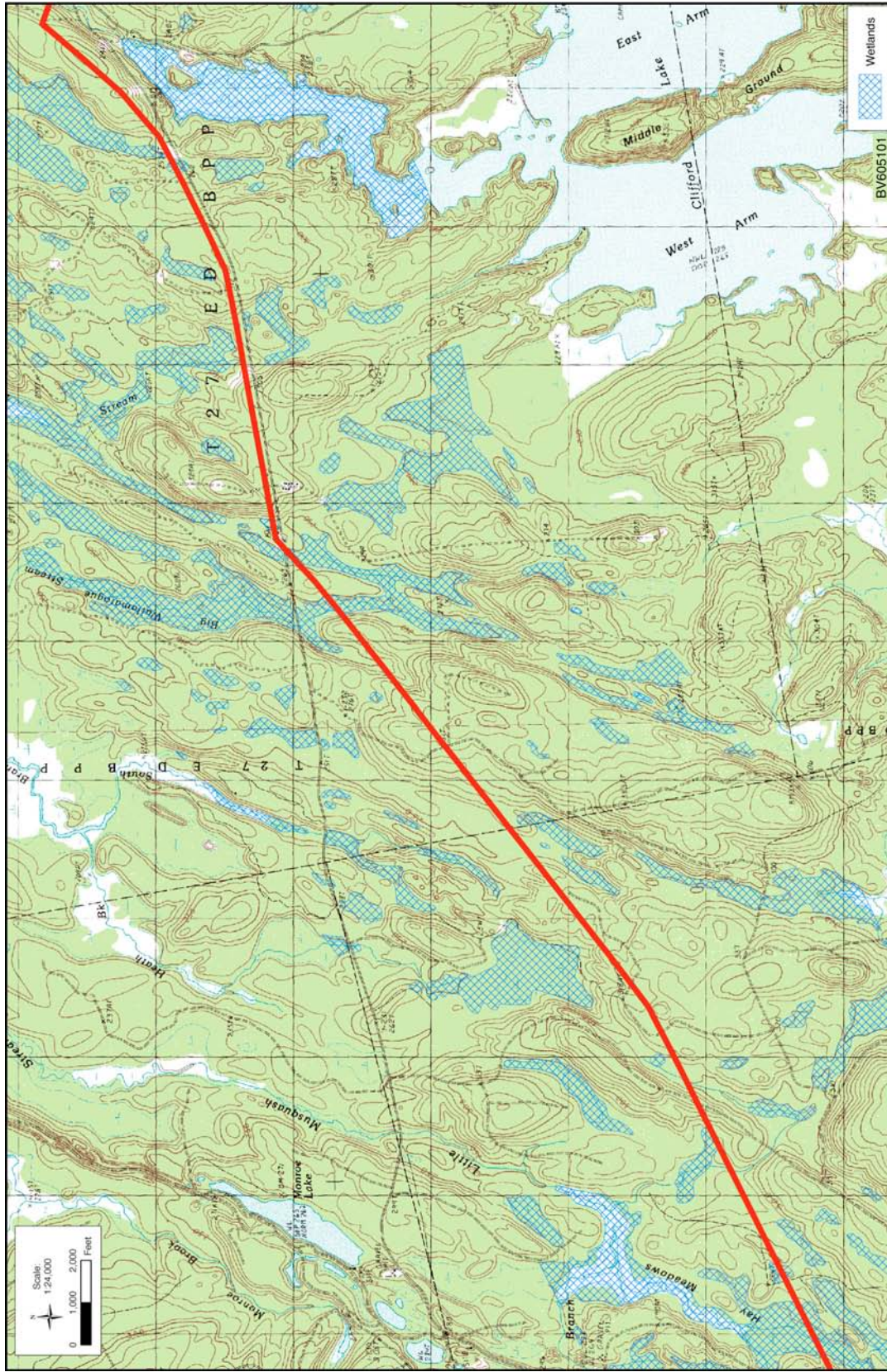


FIGURE ATT2-1k Wetlands along the Modified Consolidated Corridors Route (Cont.)

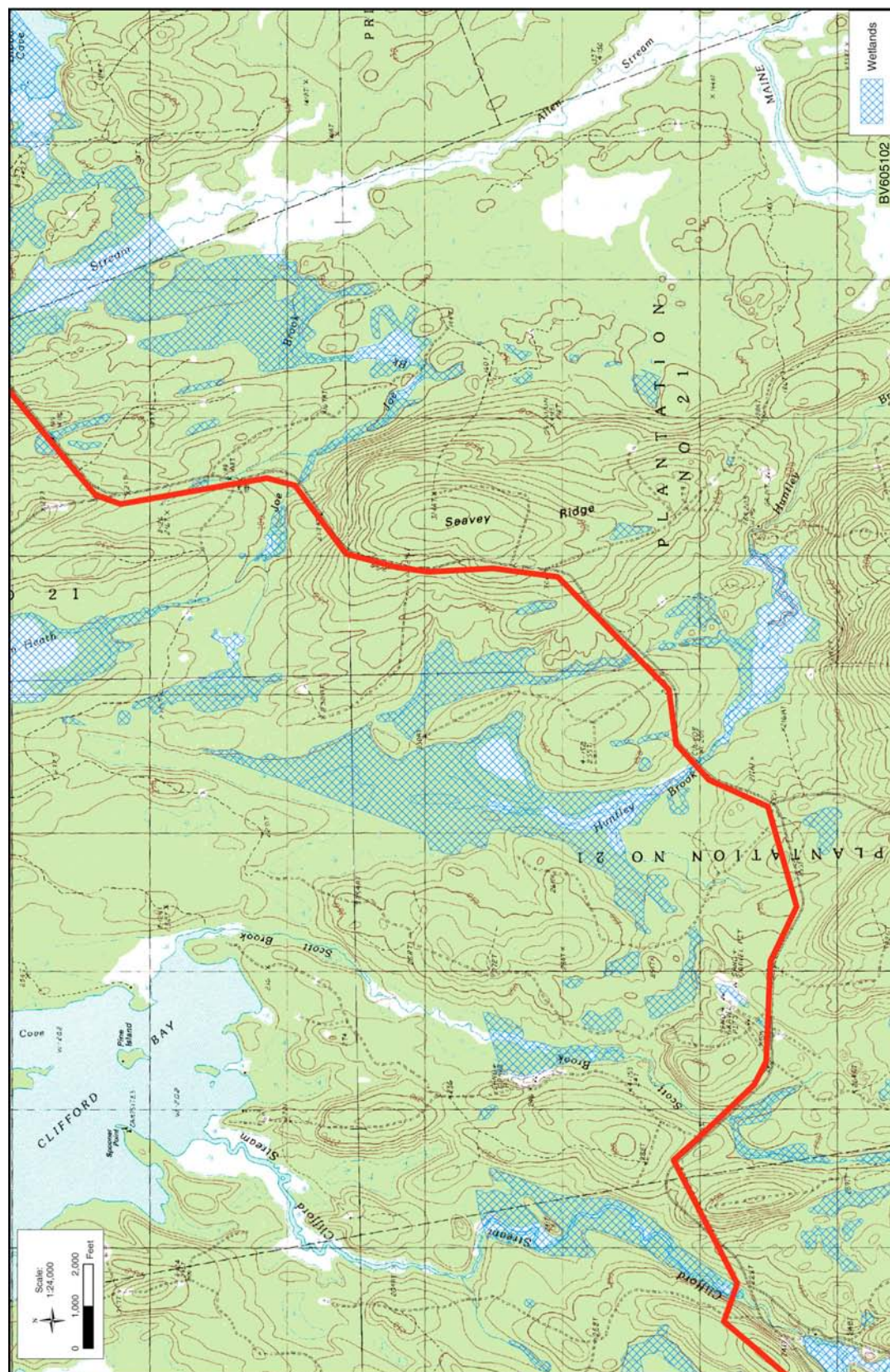




FIGURE ATT2-1m Wetlands along the Modified Consolidated Corridors Route (Cont.)

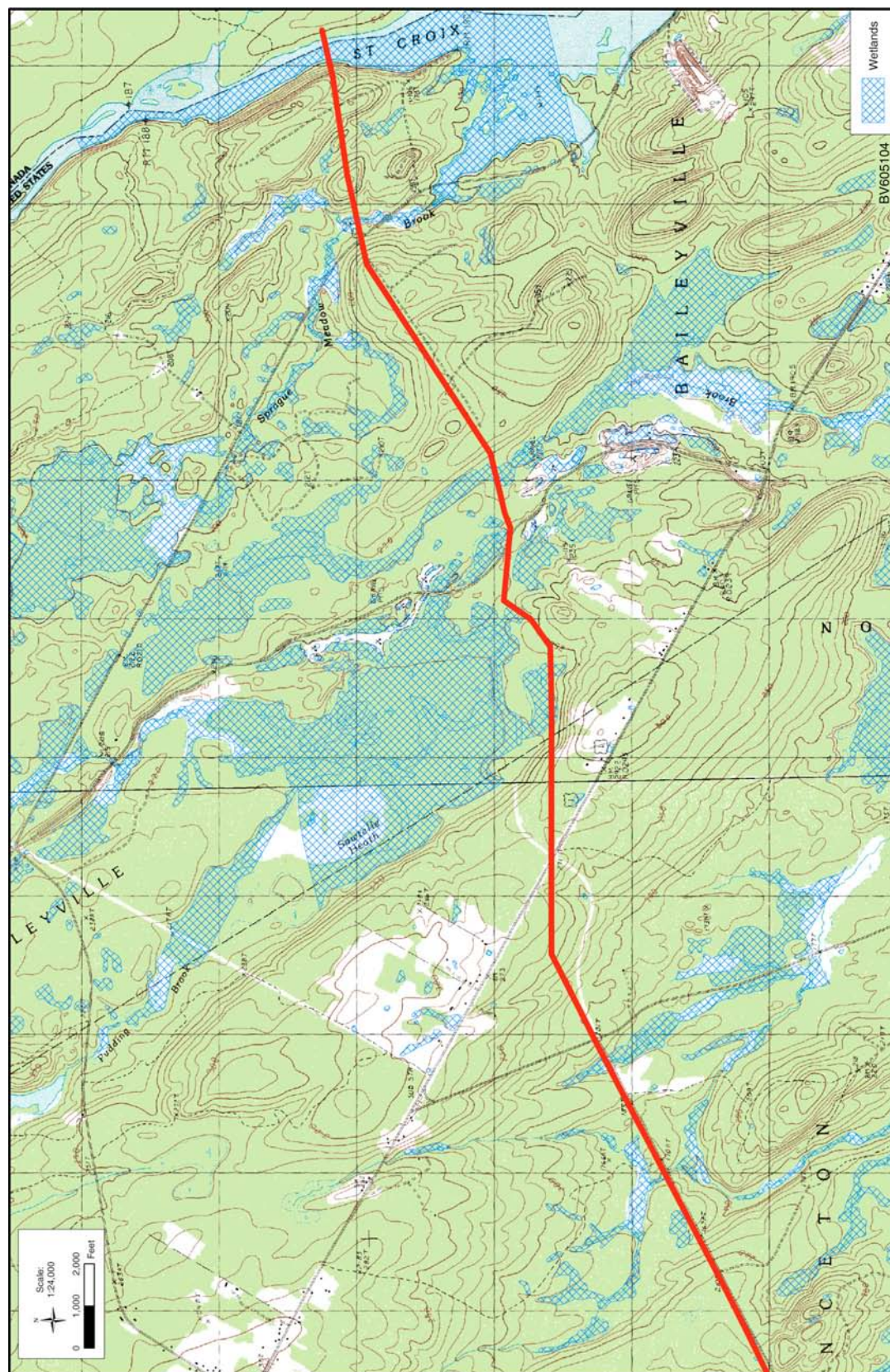


FIGURE ATT2-1n Wetlands along the Modified Consolidated Corridors Route (Cont.)

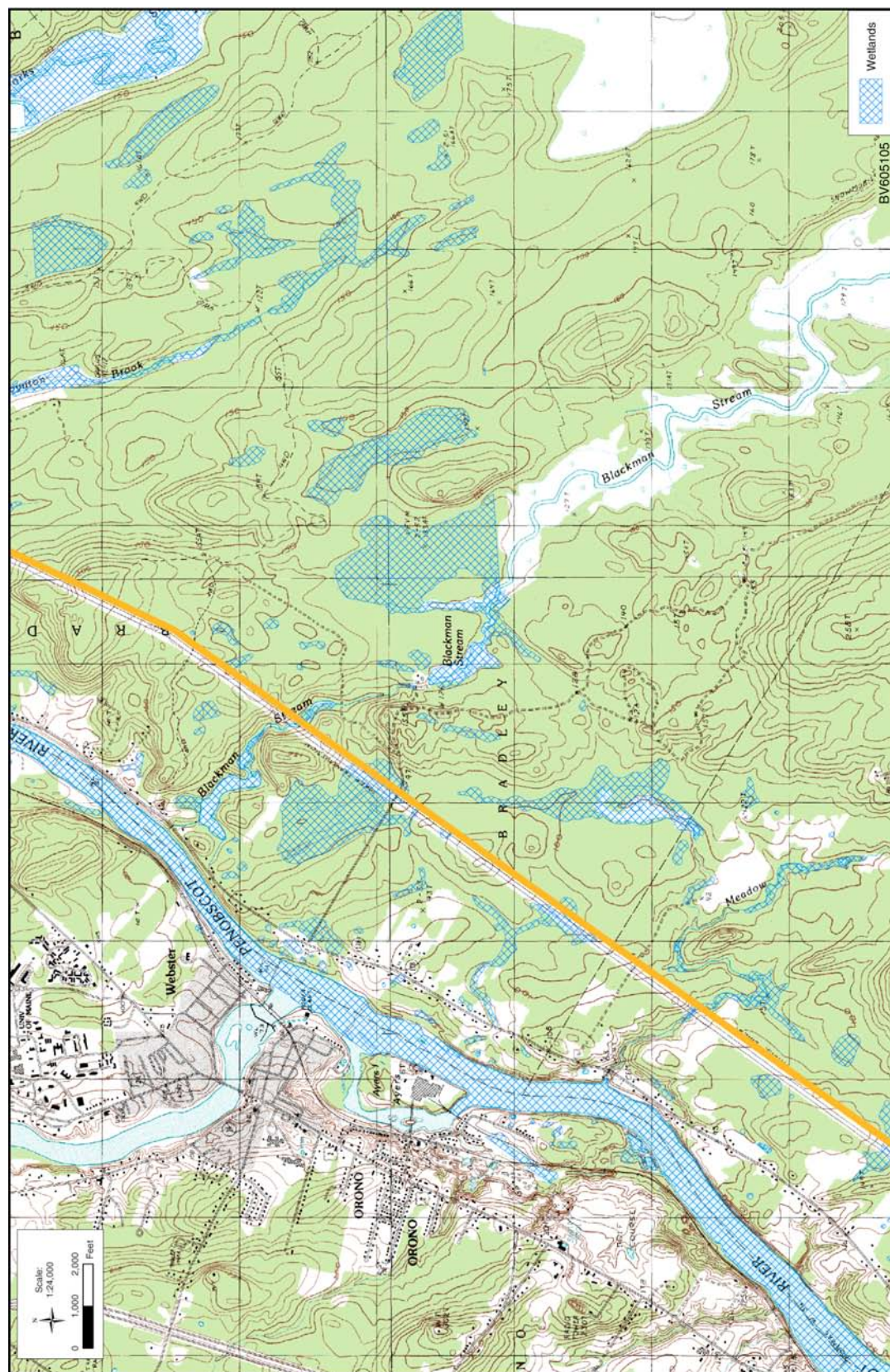


FIGURE ATT2-2a Wetlands along the Consolidated Corridors Route in the Pickerel Pond Reroute Area
(Source: Paquette 2005c)

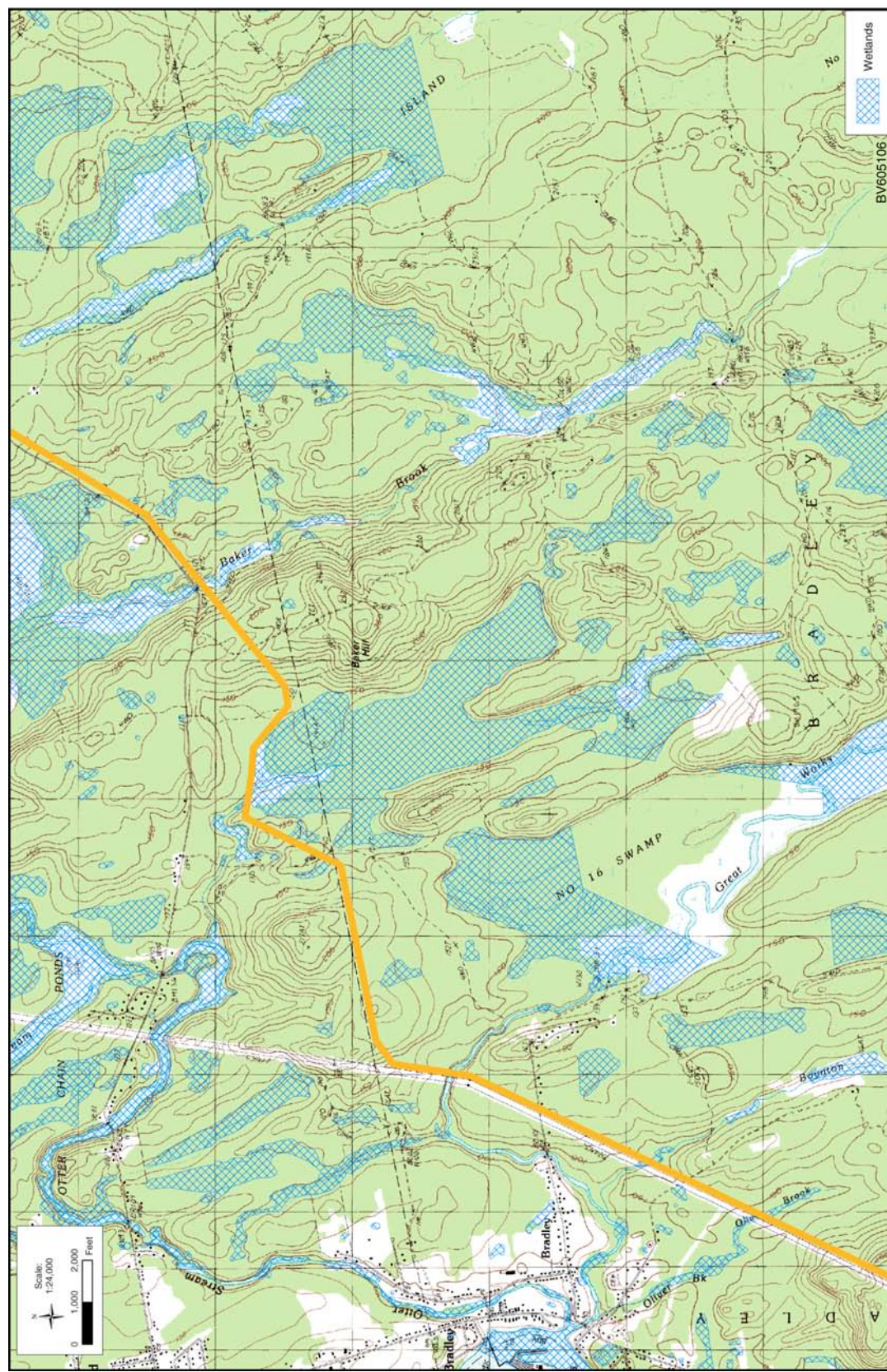


FIGURE ATT-2b Wetlands along the Consolidated Corridors Route in the Pickerel Pond Reroute Area (Cont.)

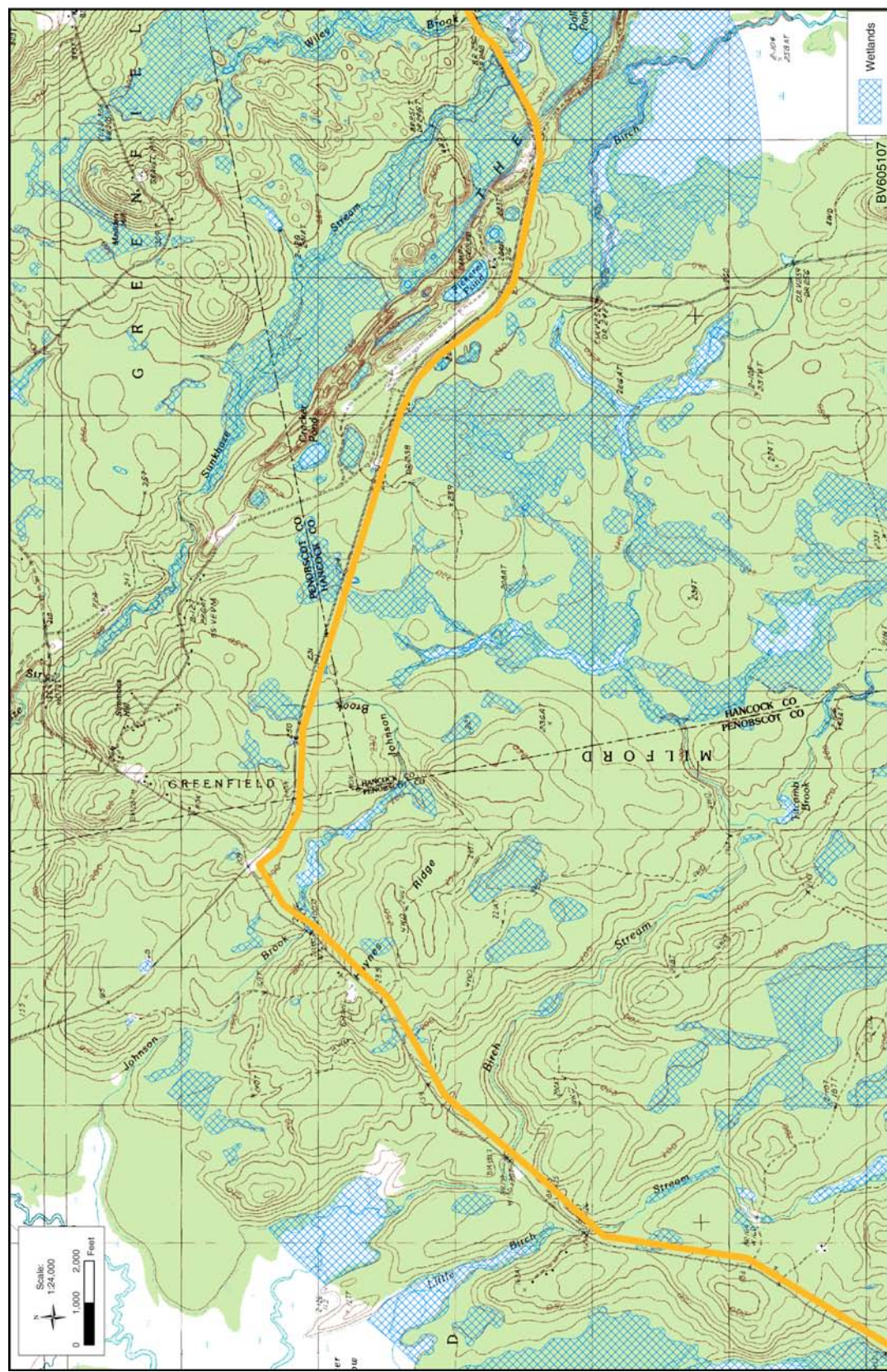


FIGURE ATT2-2c Wetlands along the Consolidated Corridors Route in the Pickerel Pond Reroute Area (Cont.)



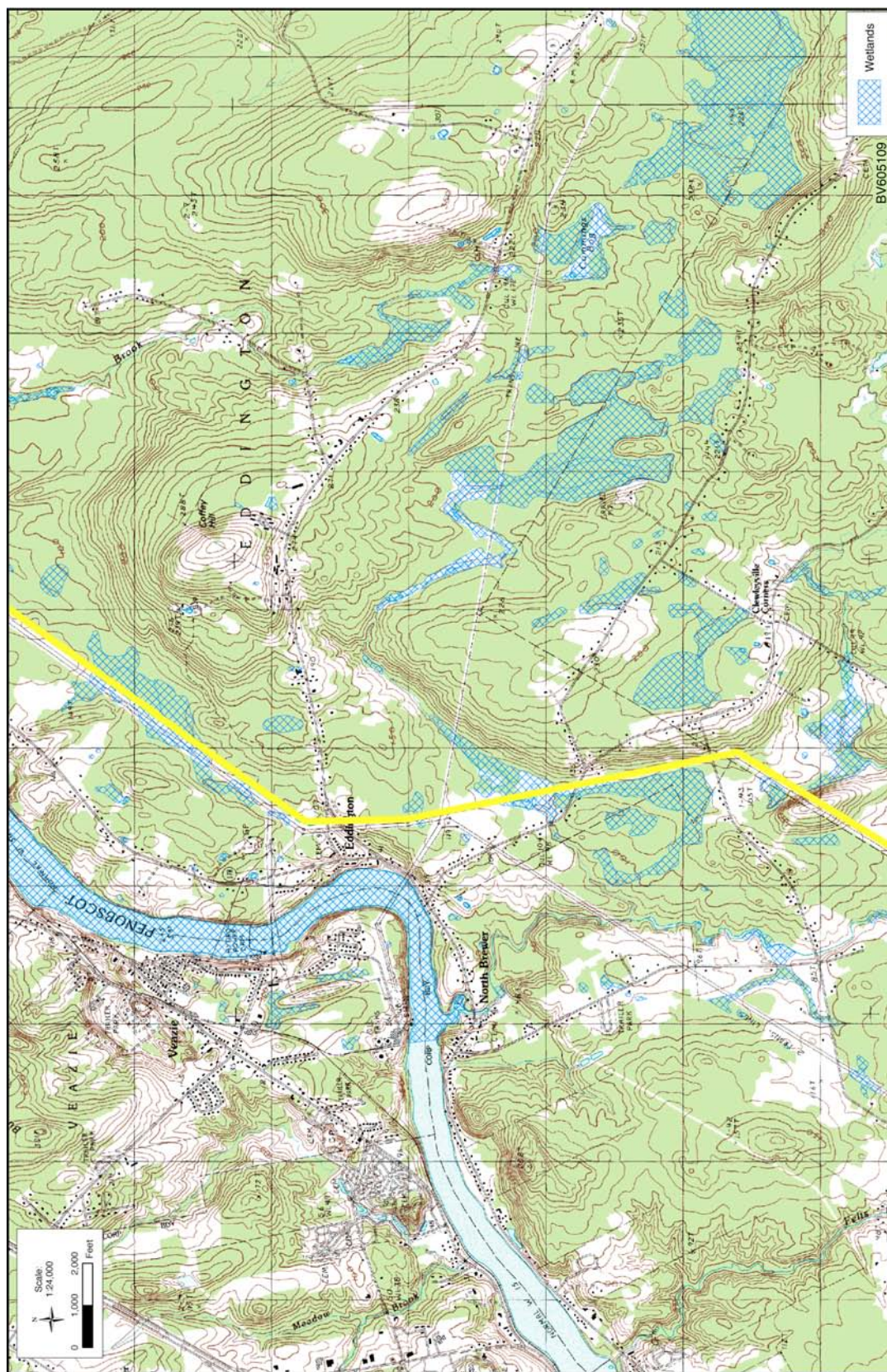


FIGURE ATT2-3b Wetlands along the Previously Permitted Route (Cont.)

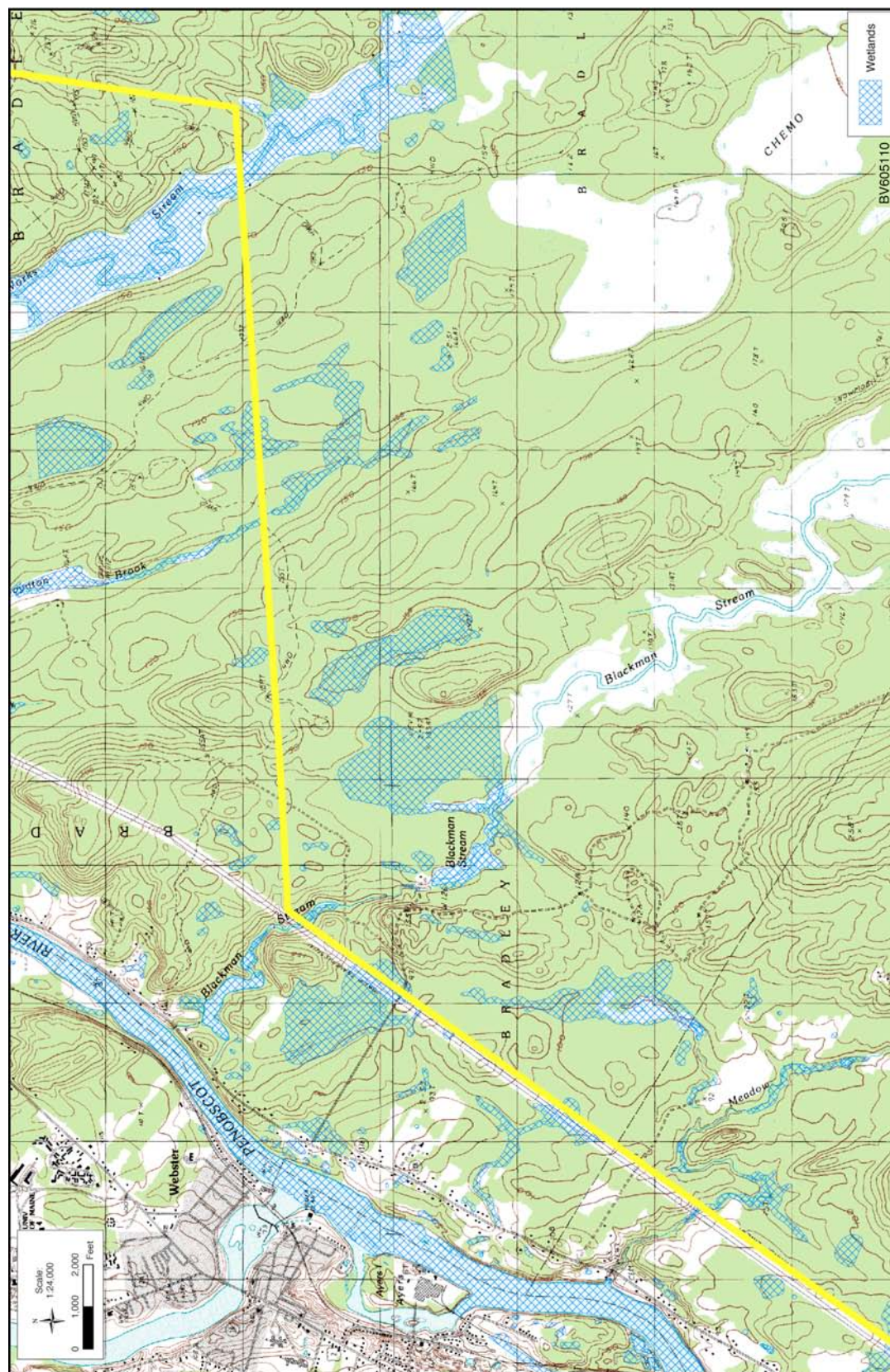
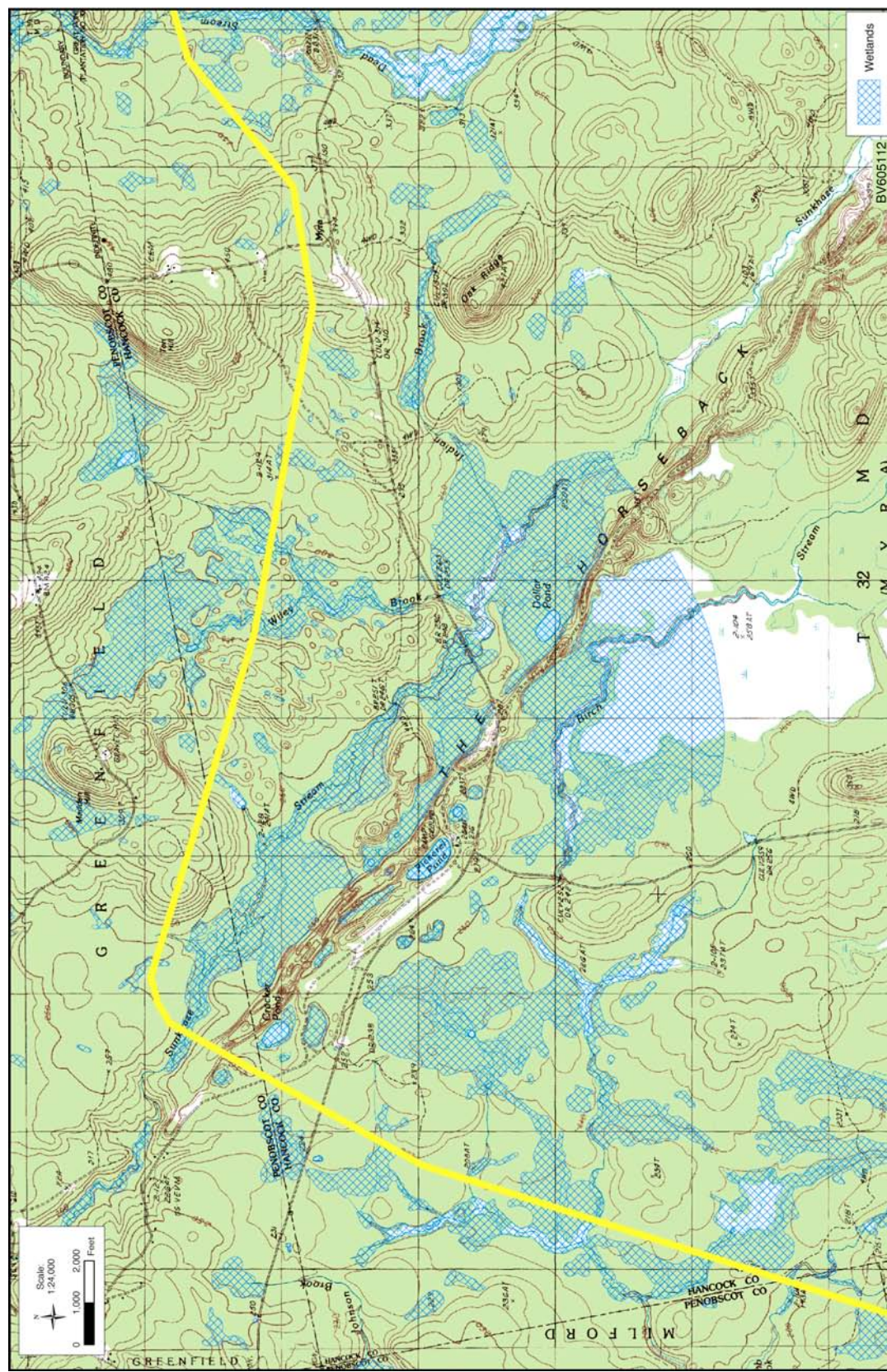


FIGURE ATT2-3c Wetlands along the Previously Permitted Route (Cont.)



FIGURE ATT2-3d Wetlands along the Previously Permitted Route (Cont.)

**FIGURE ATT2-3e Wetlands along the Previously Permitted Route (Cont.)**

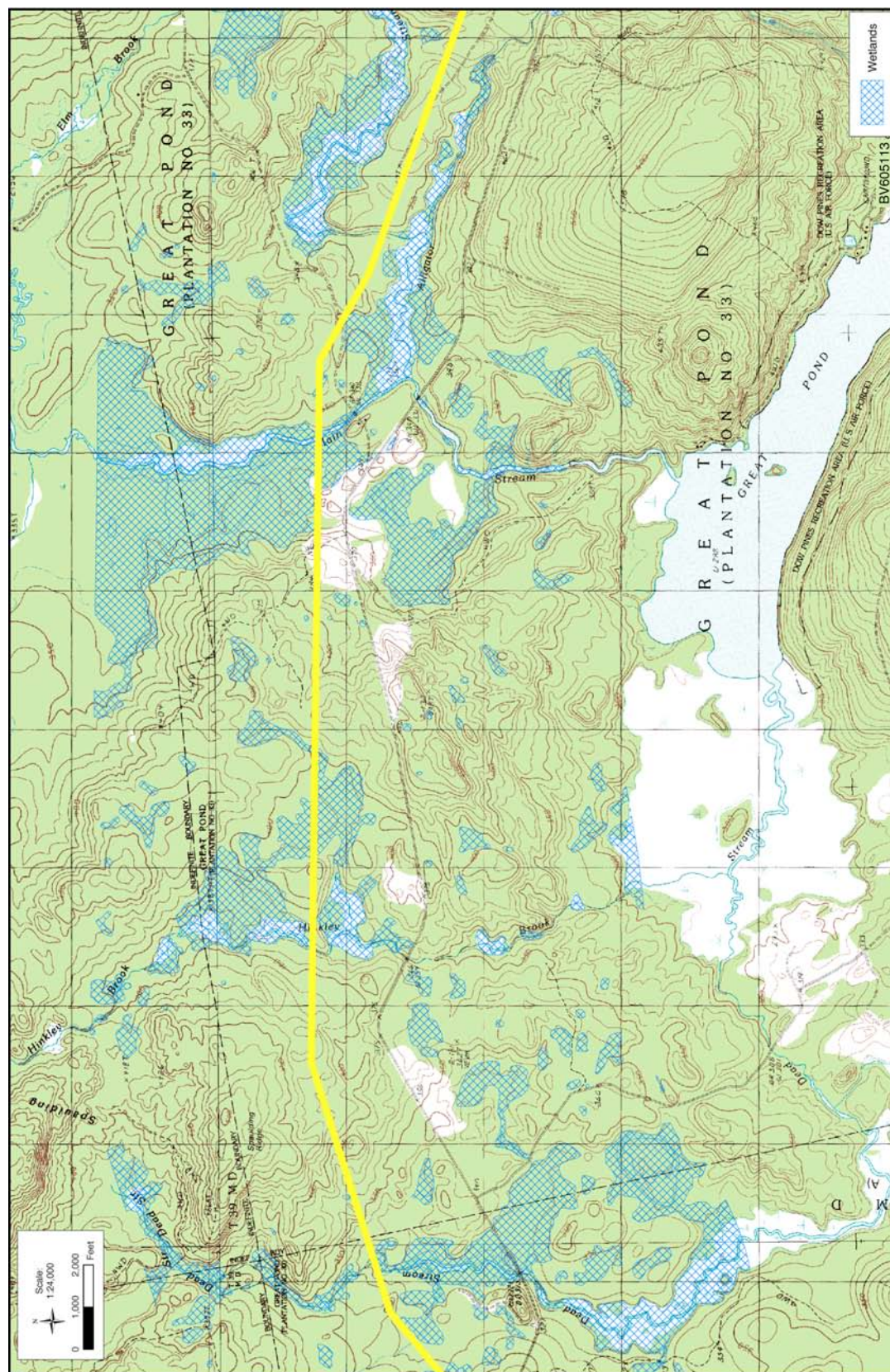


FIGURE ATT2-3f Wetlands along the Previously Permitted Route (Cont.)

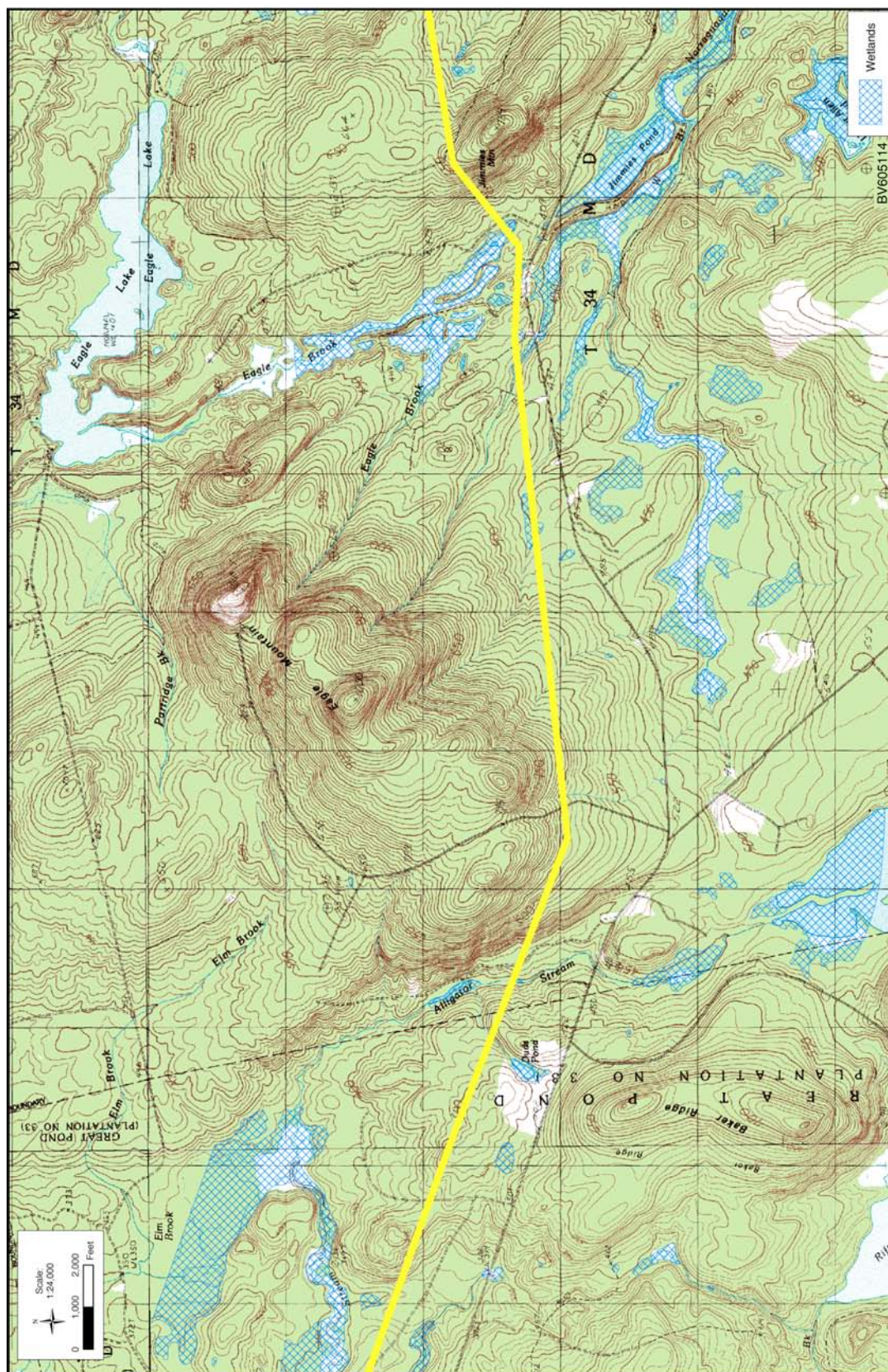


FIGURE ATT2-3g Wetlands along the Previously Permitted Route (Cont.)

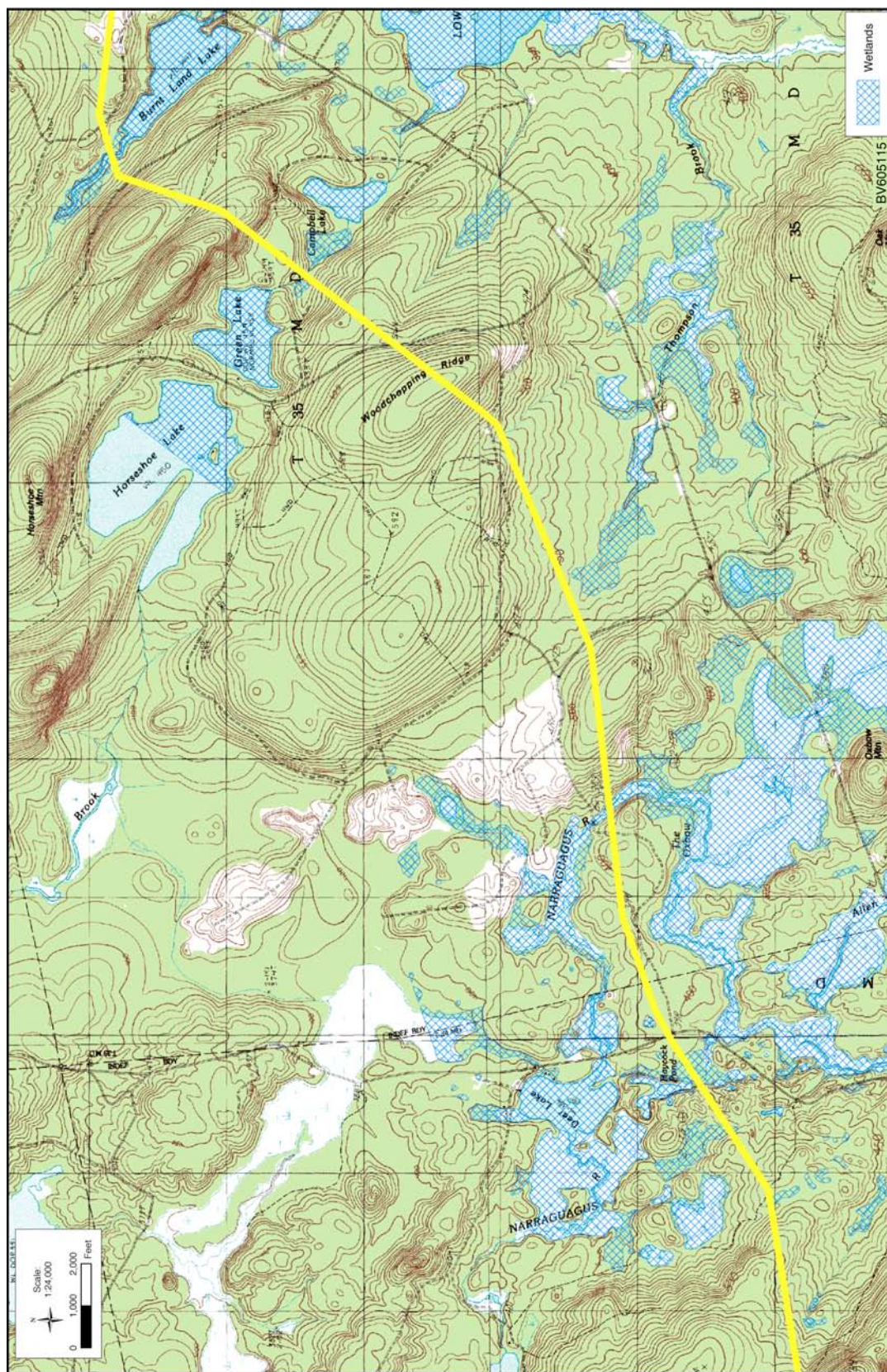


FIGURE ATT2-3h Wetlands along the Previously Permitted Route (Cont.)

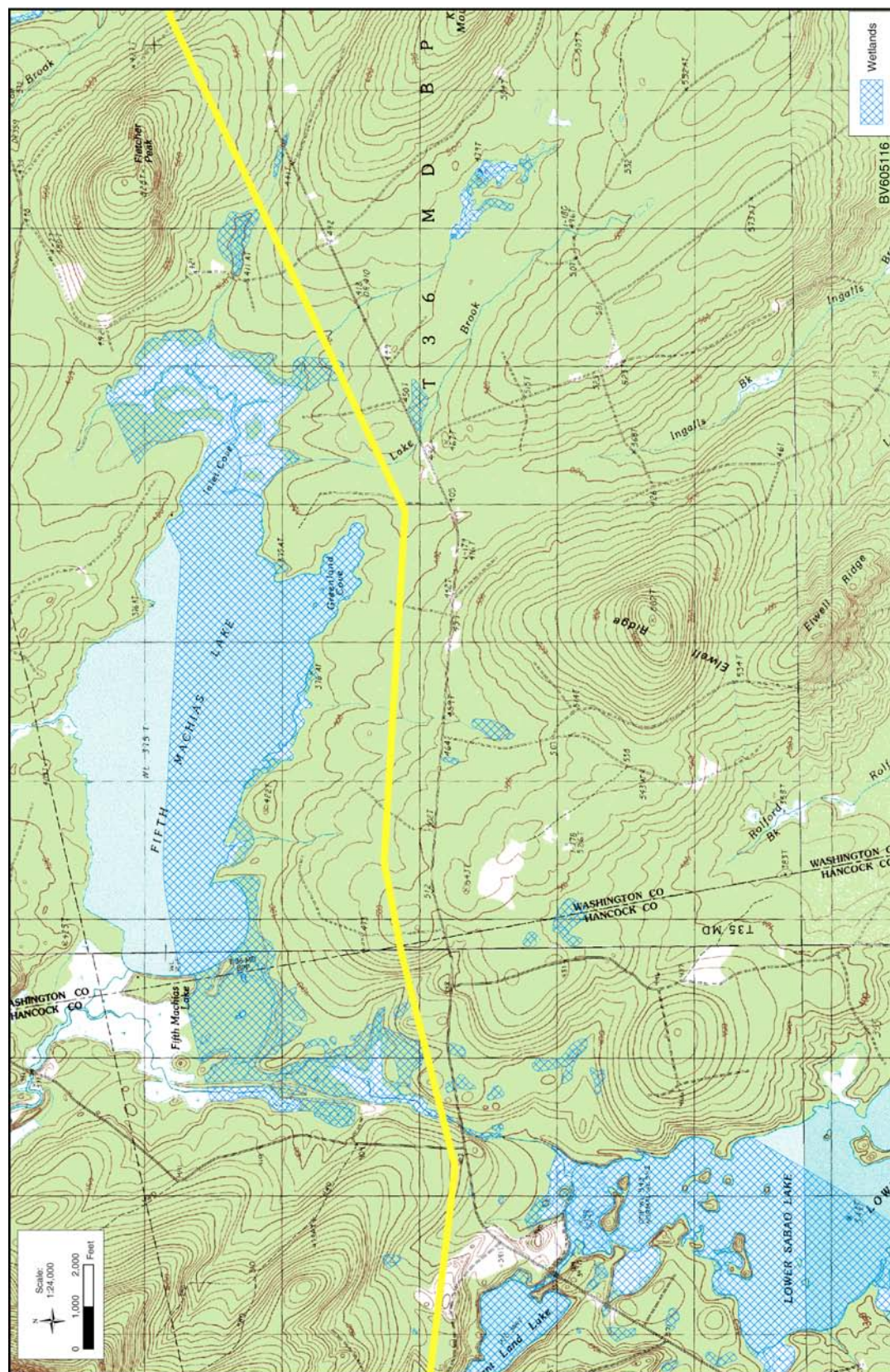


FIGURE ATT2-3i Wetlands along the Previously Permitted Route (Cont.)







FIGURE ATT2-31 Wetlands along the Previously Permitted Route (Cont.)



FIGURE ATT2-3m Wetlands along the Previously Permitted Route (Cont.)

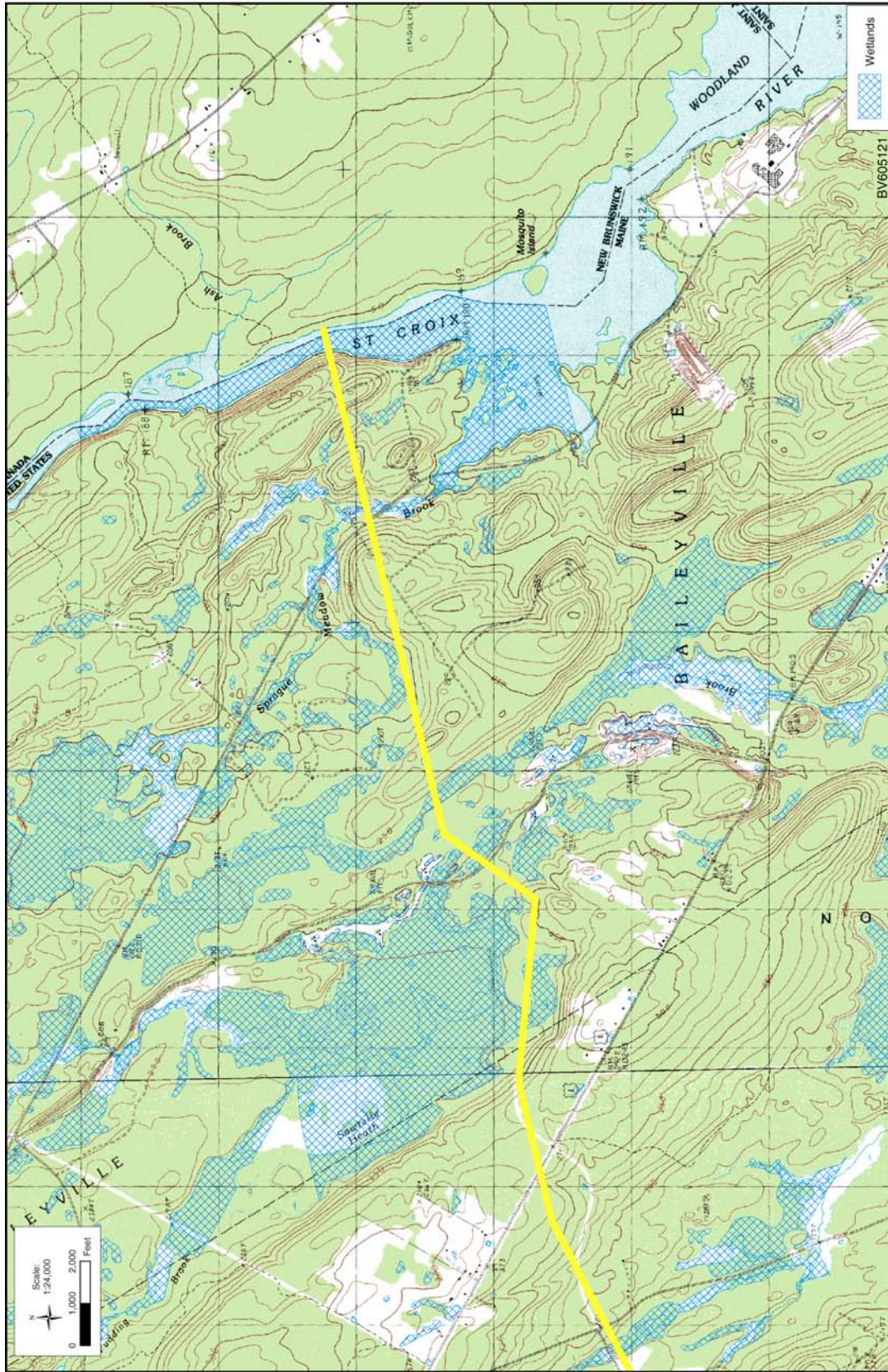


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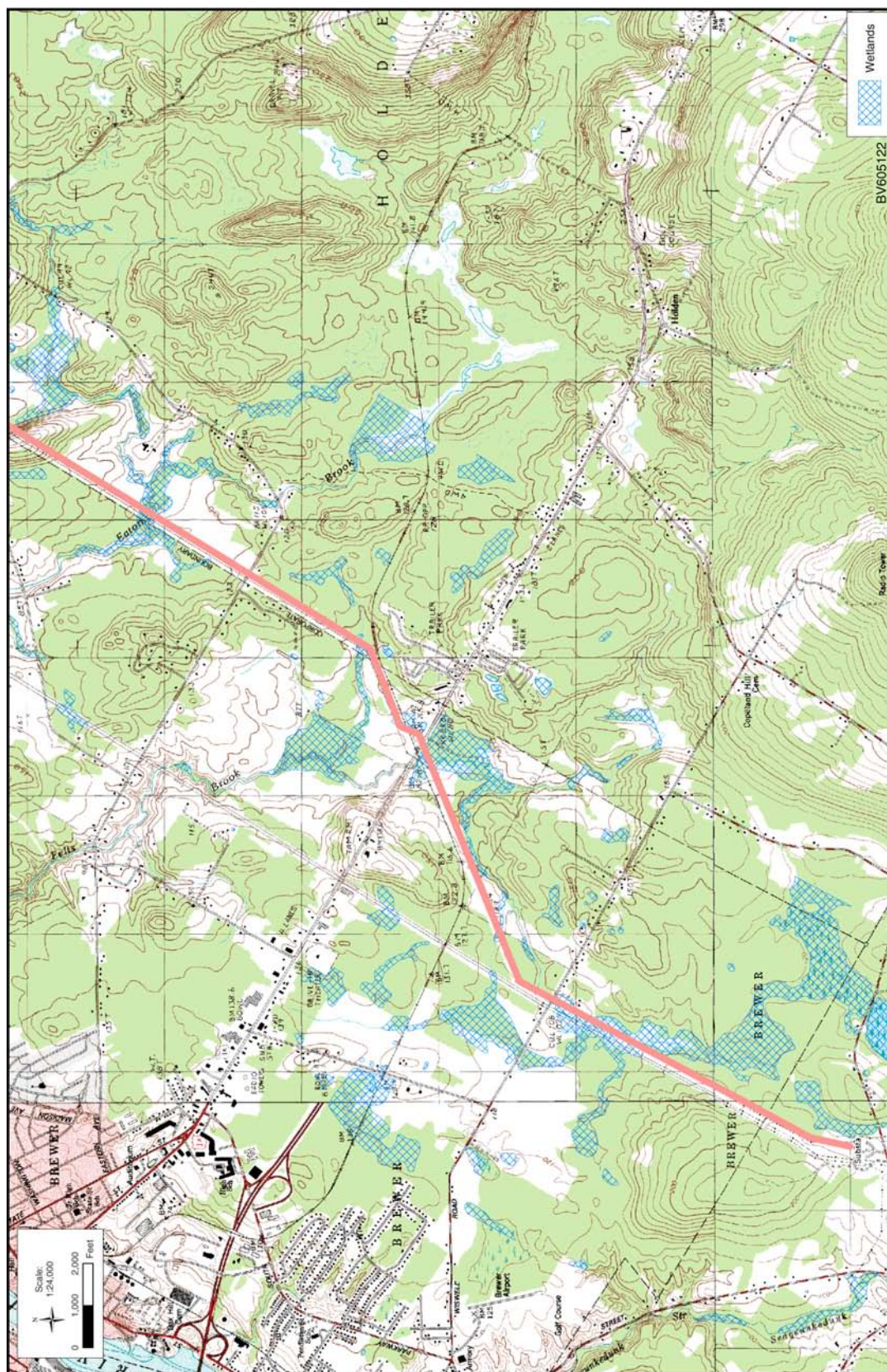


FIGURE ATT2-4a Wetlands along the MEPCO South Route (Source: Paquette 2005c)

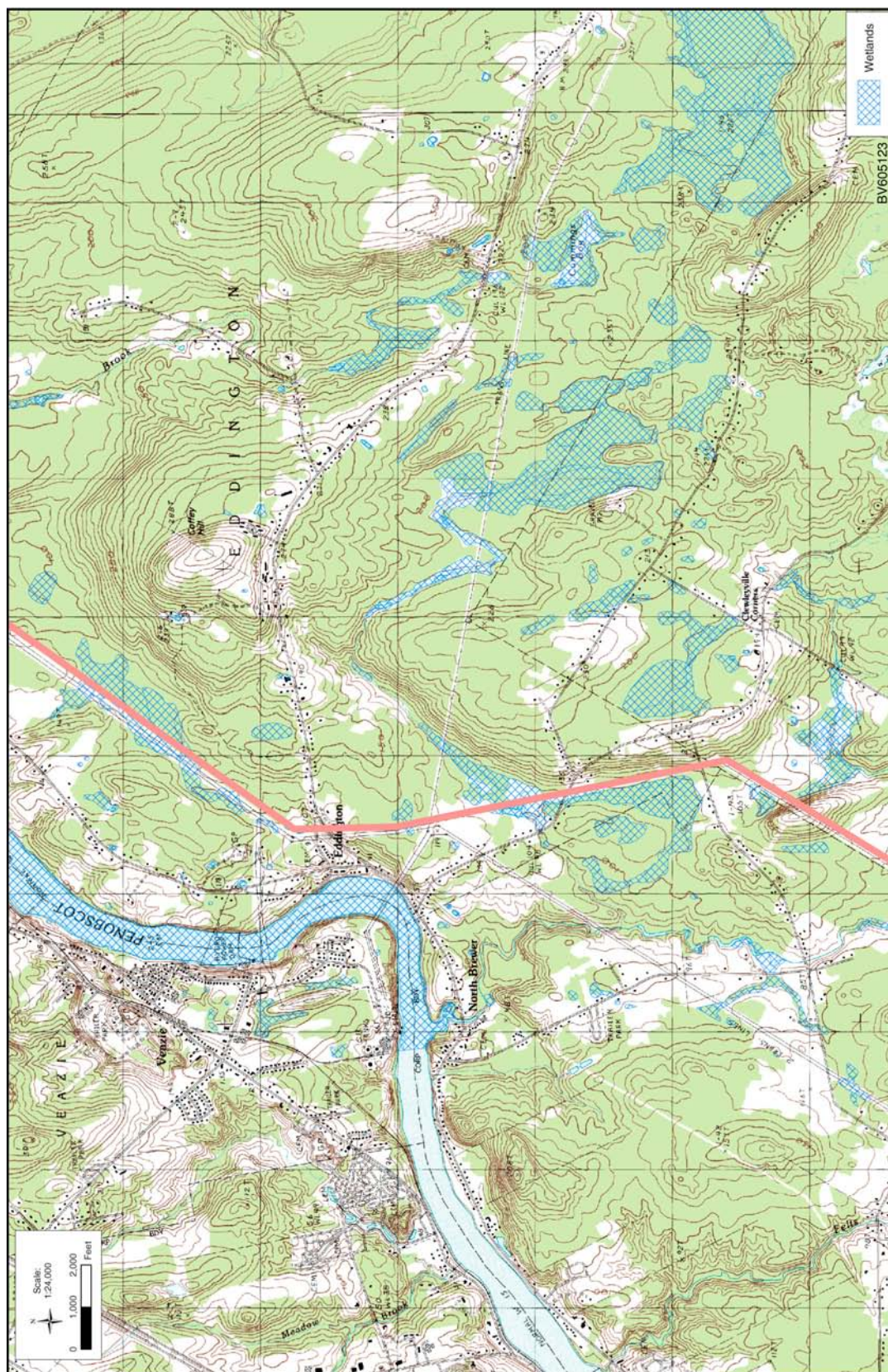


FIGURE ATT2-4b Wetlands along the MEPCO South Route (Cont.)

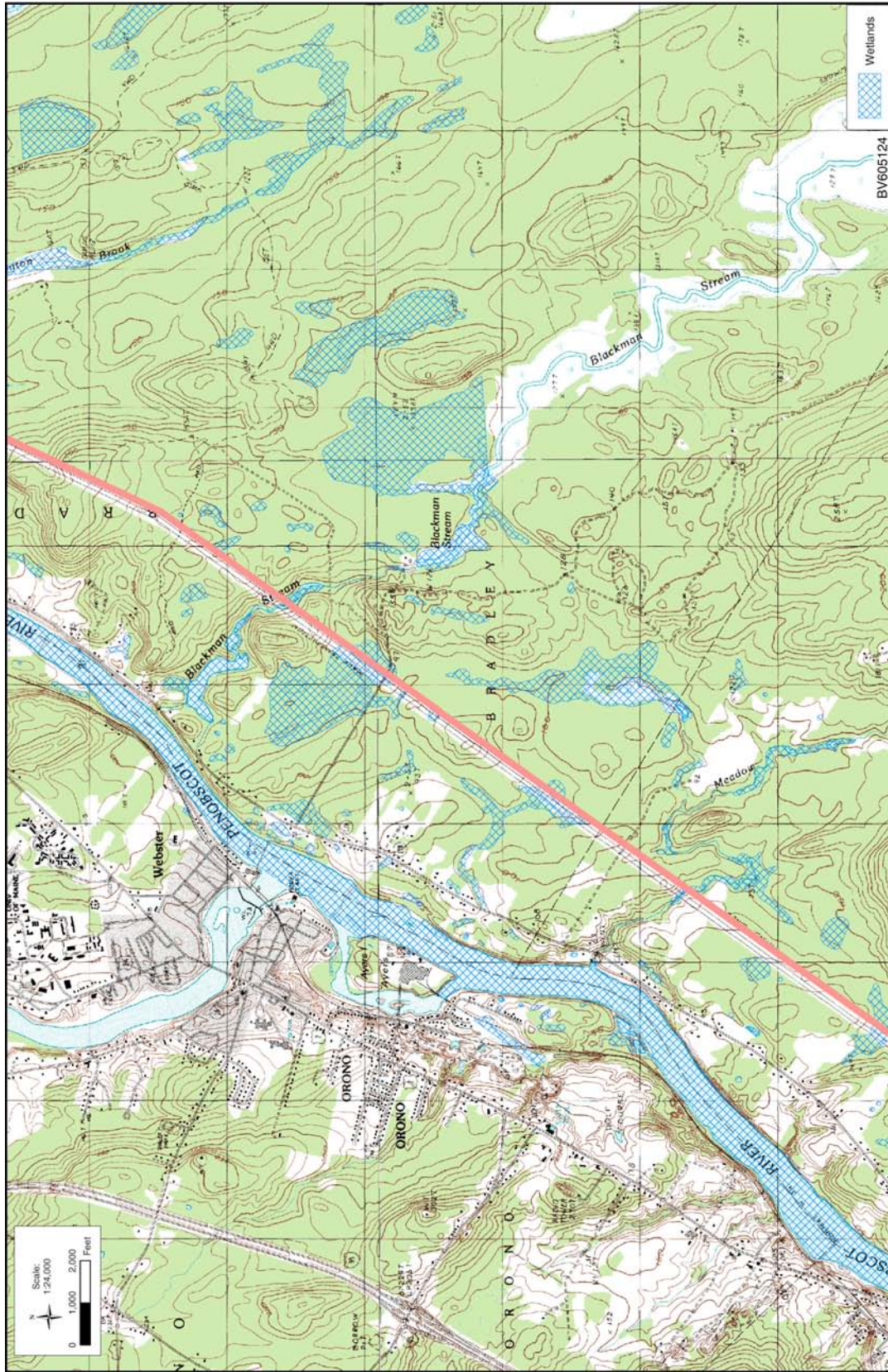
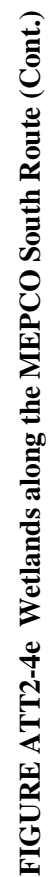


FIGURE ATT2-4c Wetlands along the MEPSCO South Route (Cont.)



FIGURE ATT2-4d Wetlands along the MEPCO South Route (Cont.)



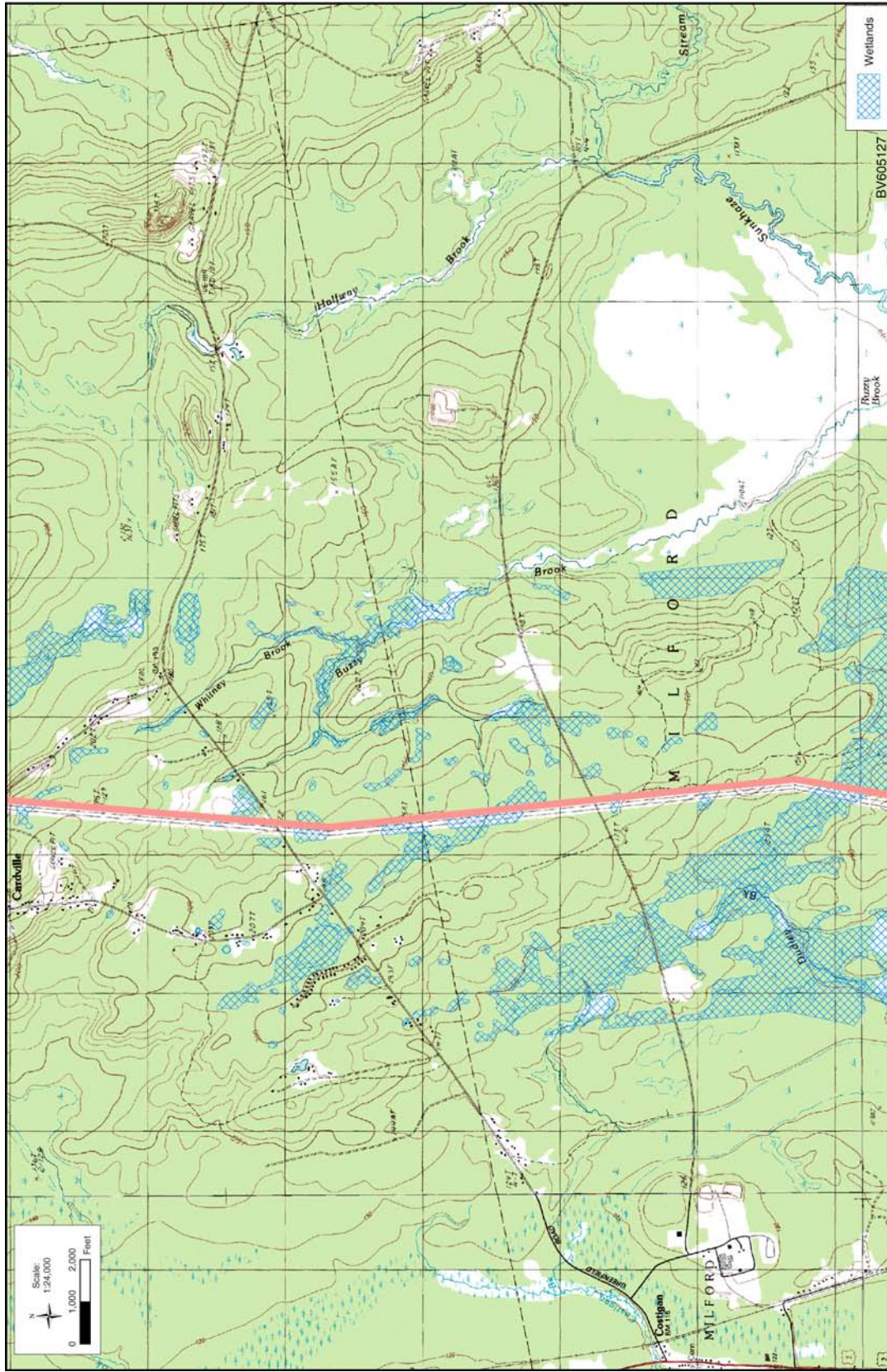


FIGURE ATT2-4f Wetlands along the MEPCO South Route (Cont.)

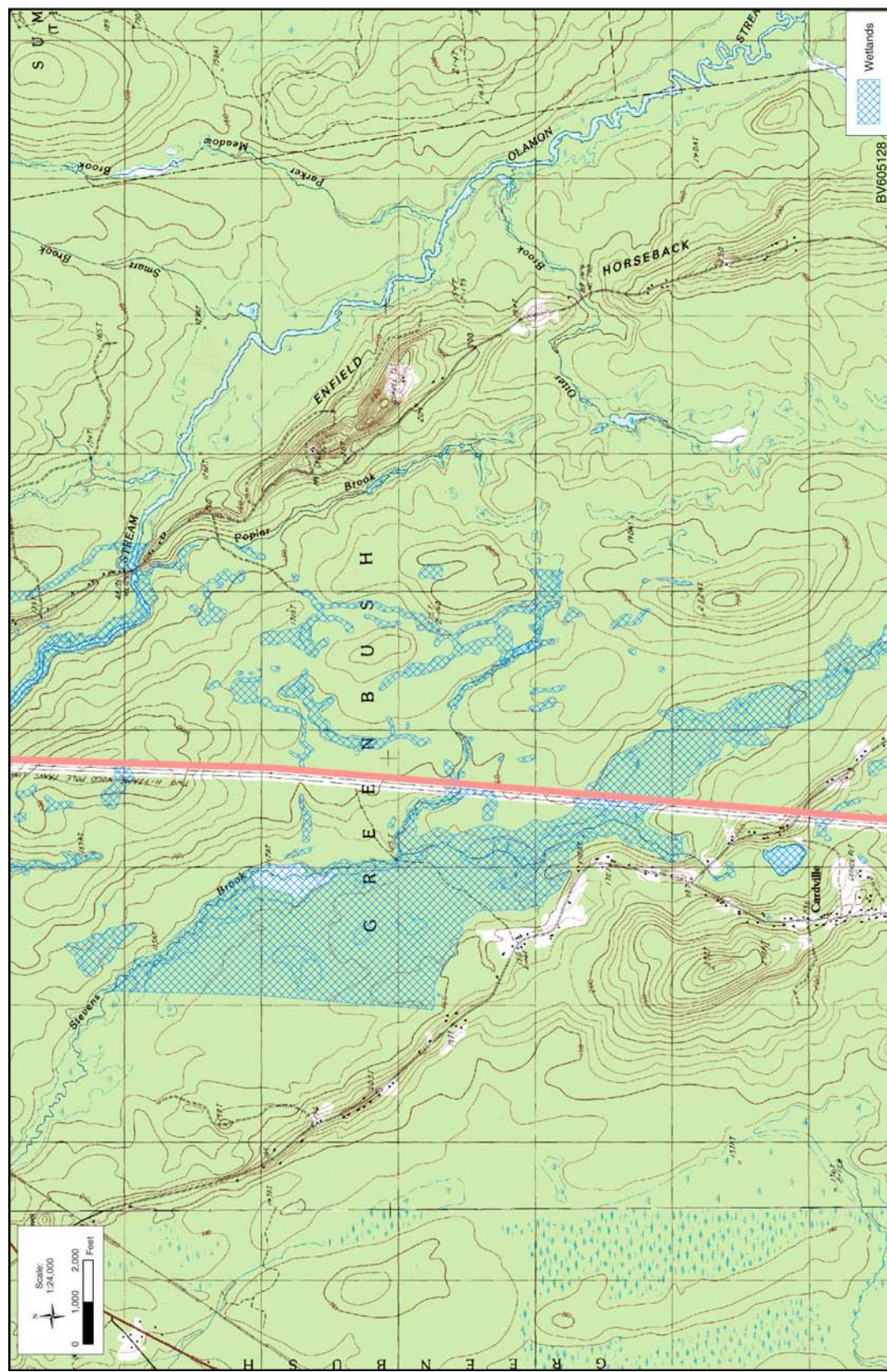
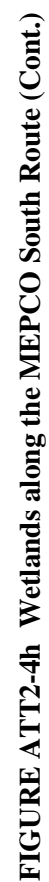


FIGURE ATT2-4g Wetlands along the MEPCO South Route (Cont.)



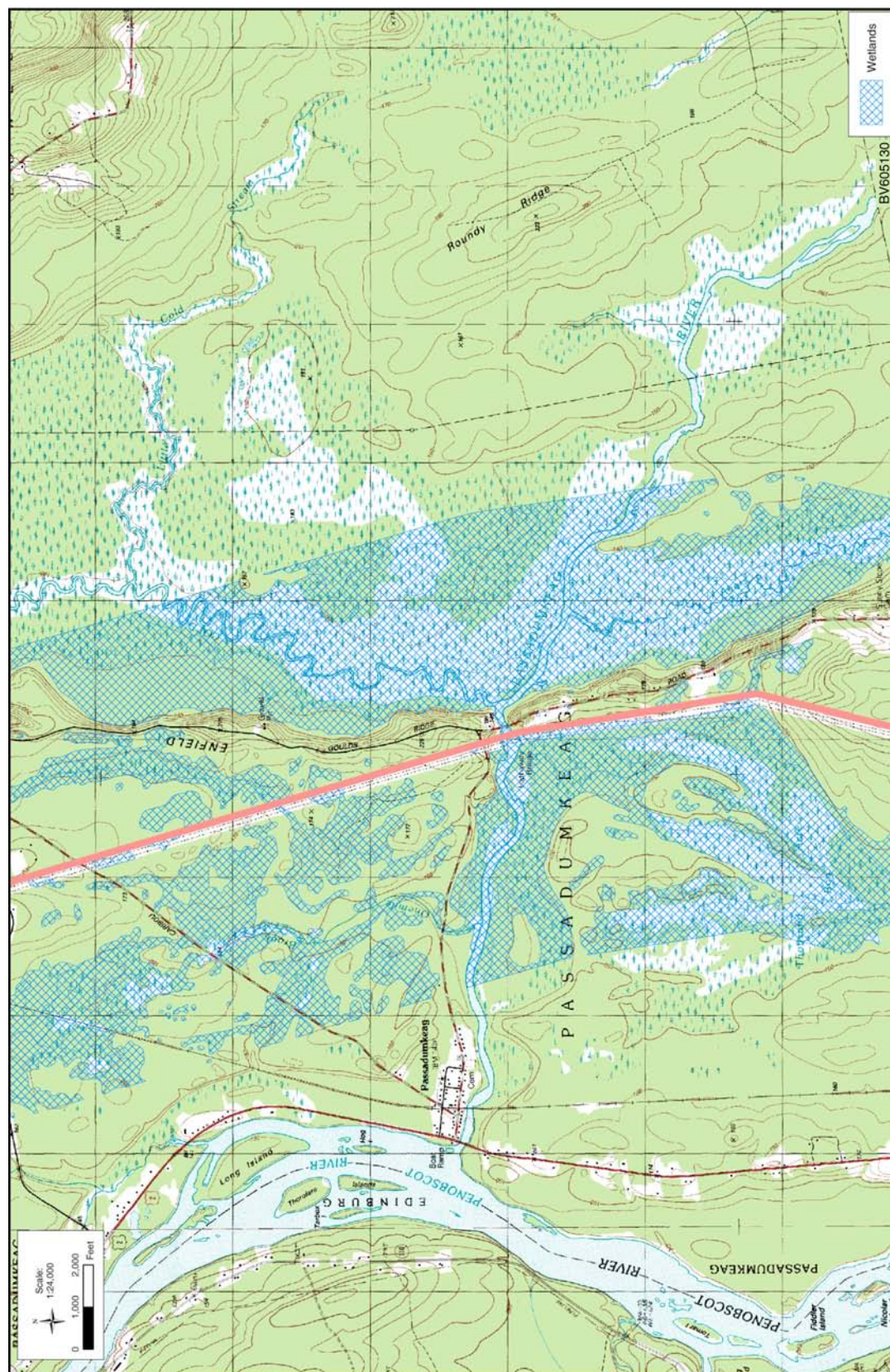


FIGURE ATT2-4i Wetlands along the MEPCO South Route (Cont.)

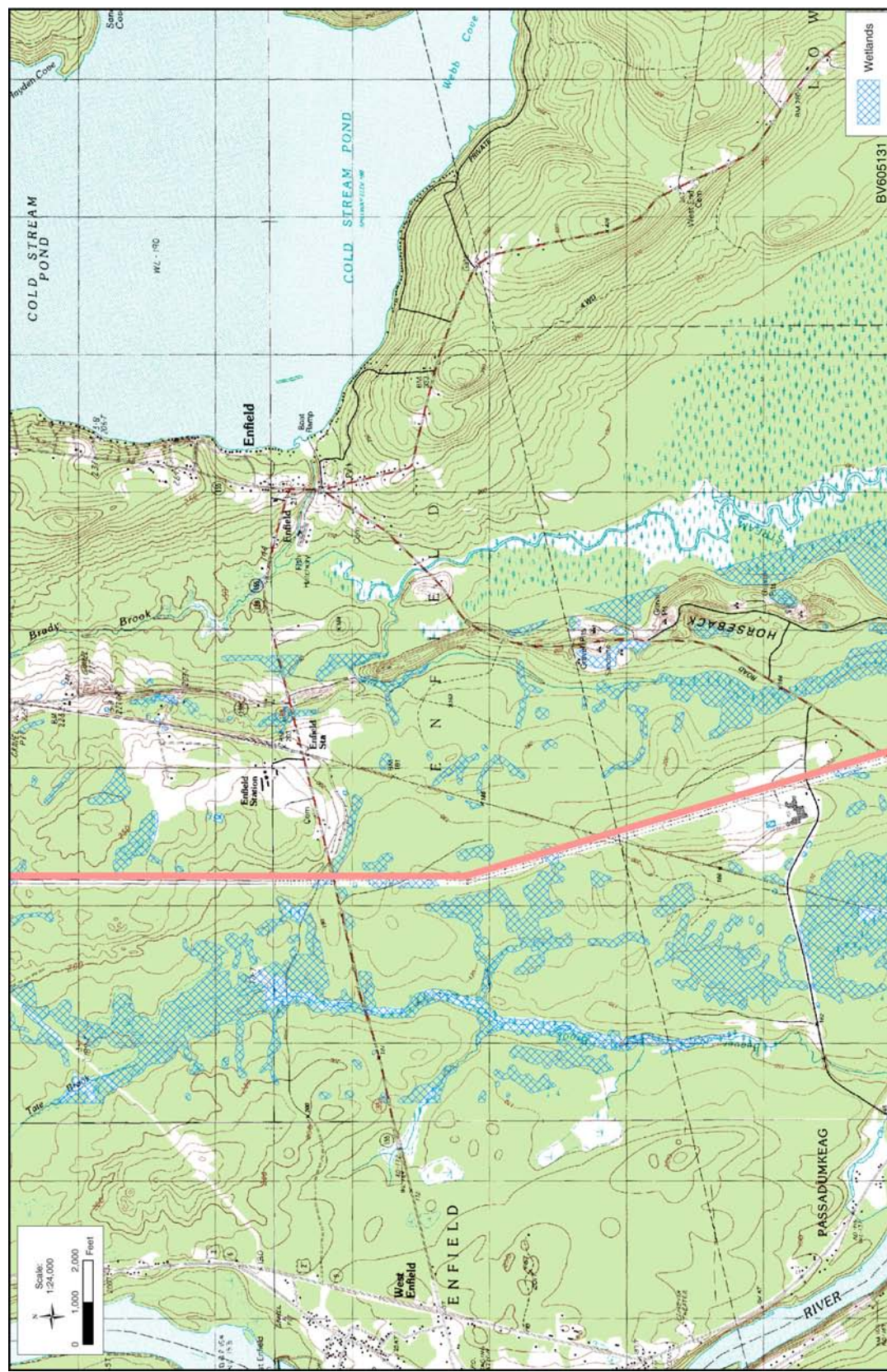


FIGURE ATT2-4j Wetlands along the MEPCO South Route (Cont.)

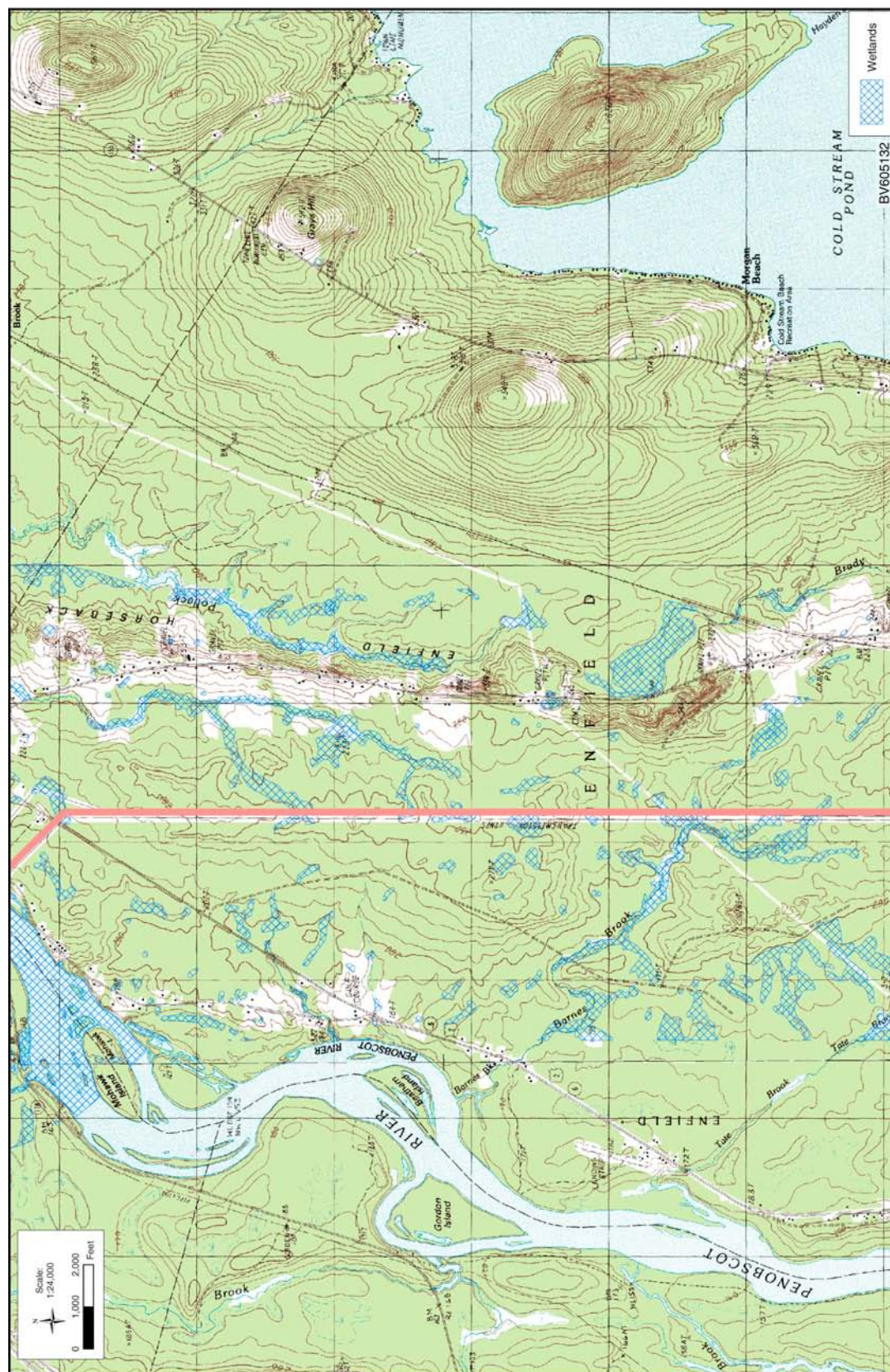


FIGURE ATT2-4k Wetlands along the MEPCO South Route (Cont.)

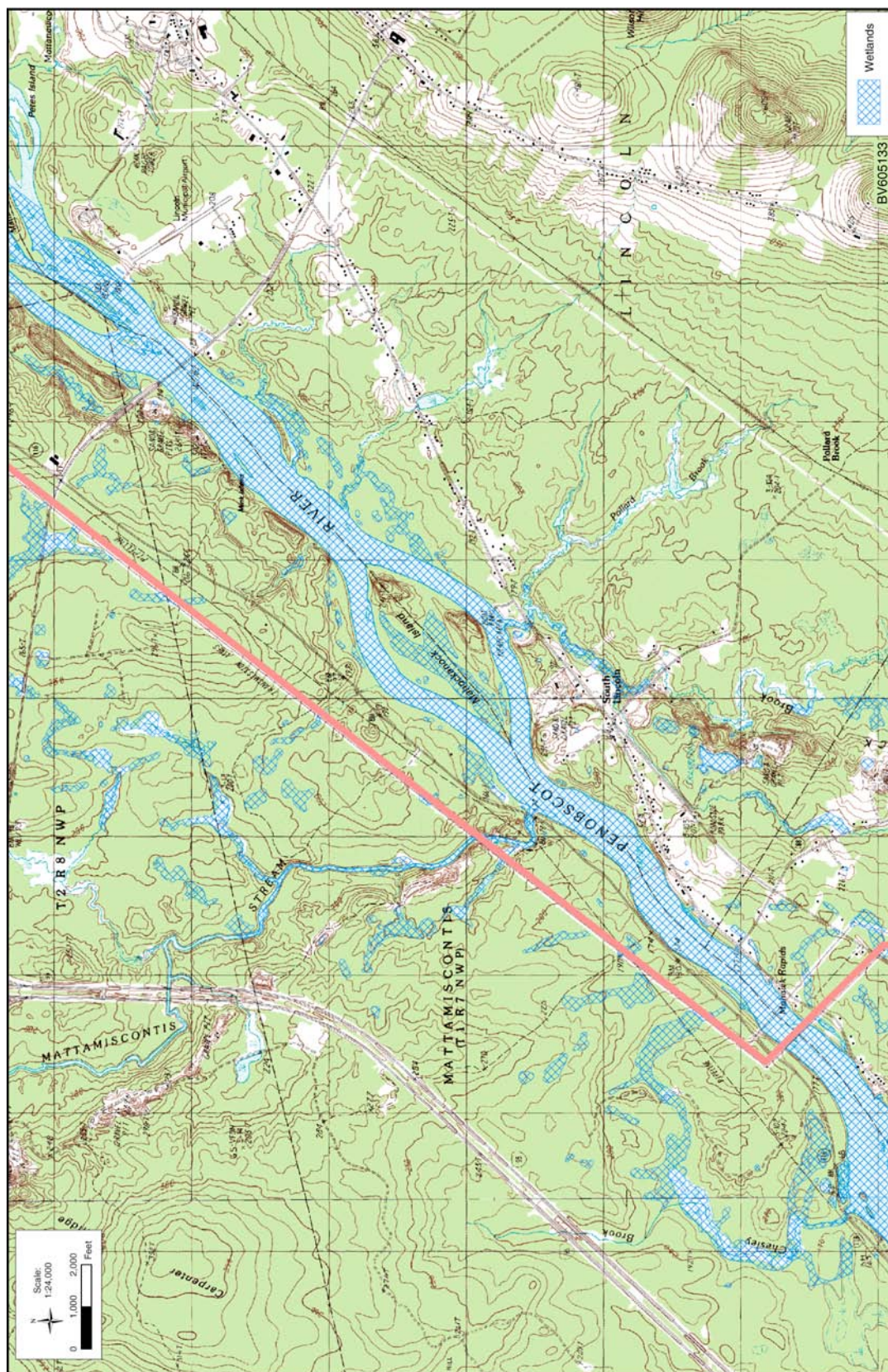


FIGURE ATT2-41 Wetlands along the MEPCO South Route (Cont.)

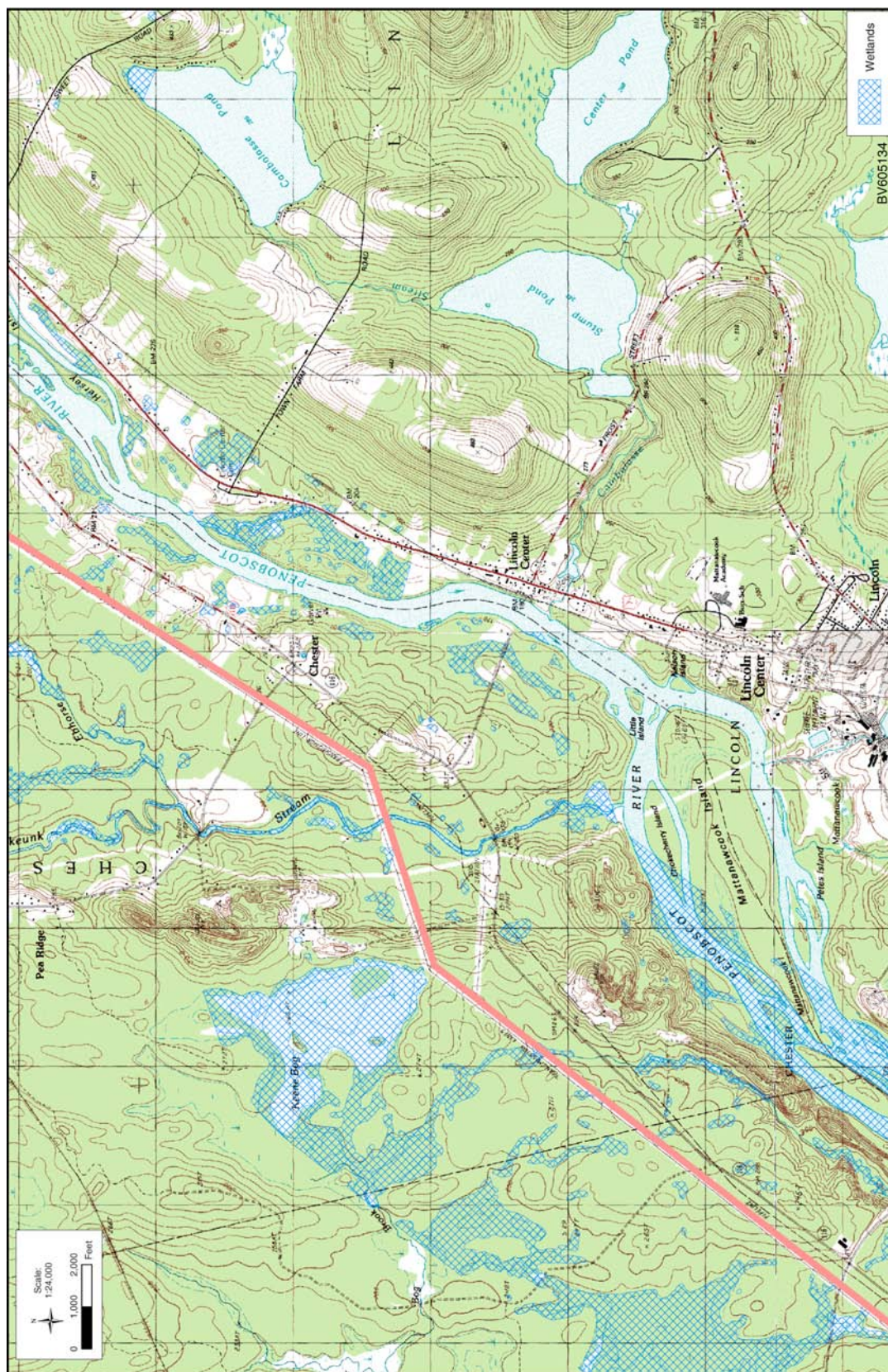


FIGURE ATT2-4m Wetlands along the MEPCO South Route (Cont.)

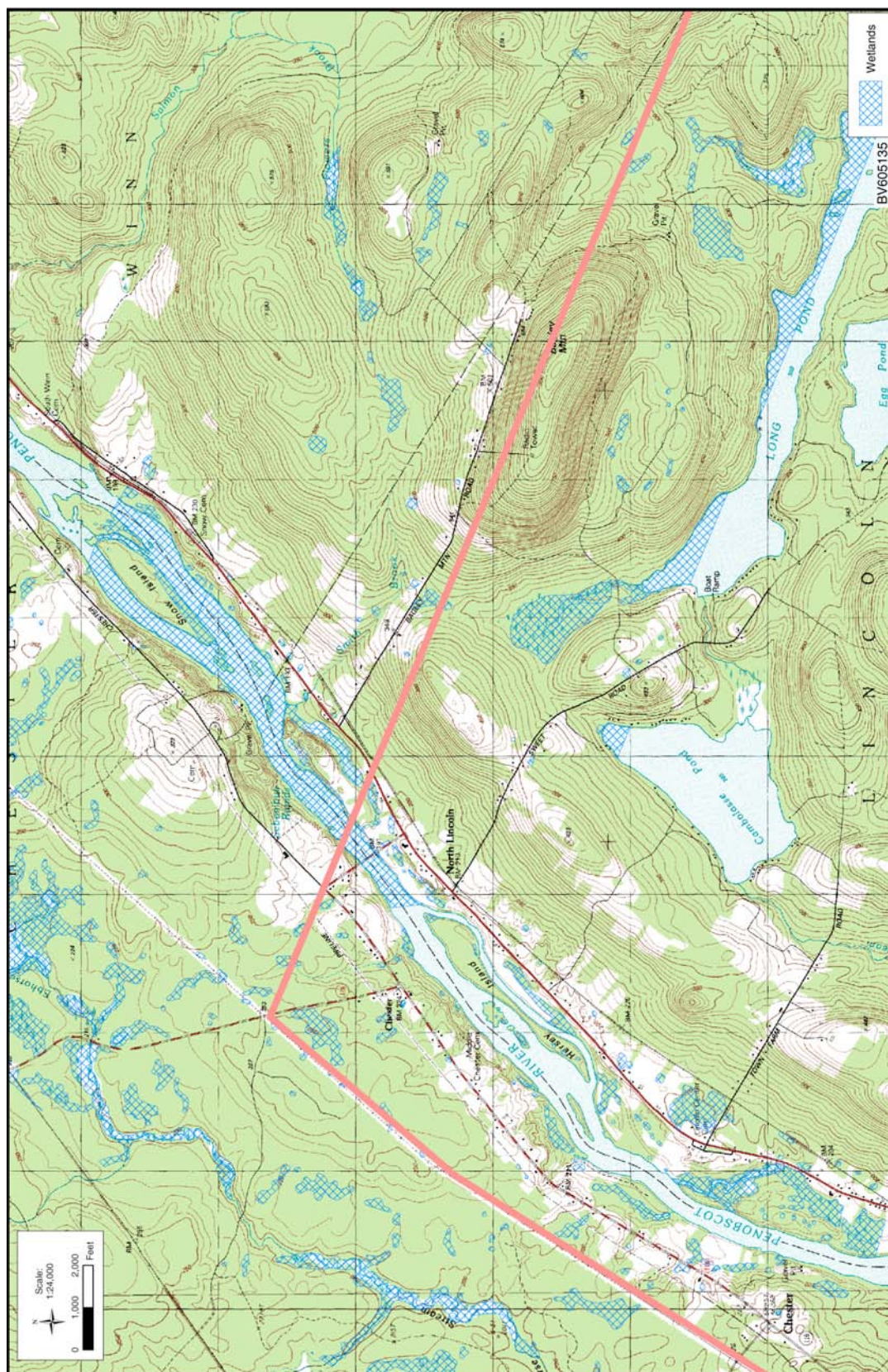
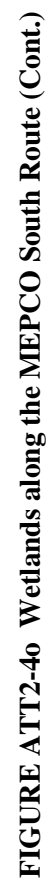


FIGURE ATT2-4n Wetlands along the MEPCO South Route (Cont.)



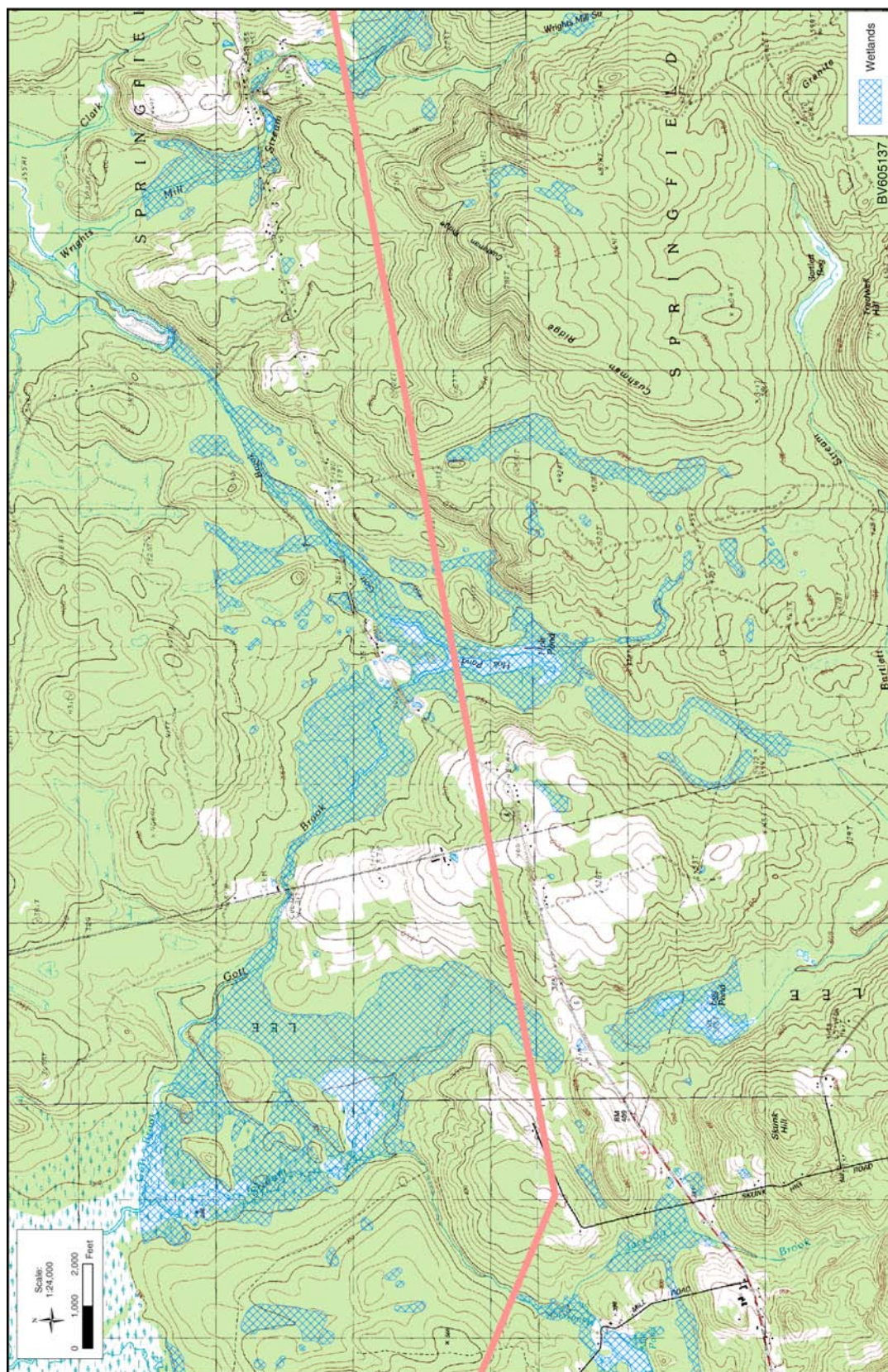


FIGURE ATT2-4p Wetlands along the MEPCO South Route (Cont.)

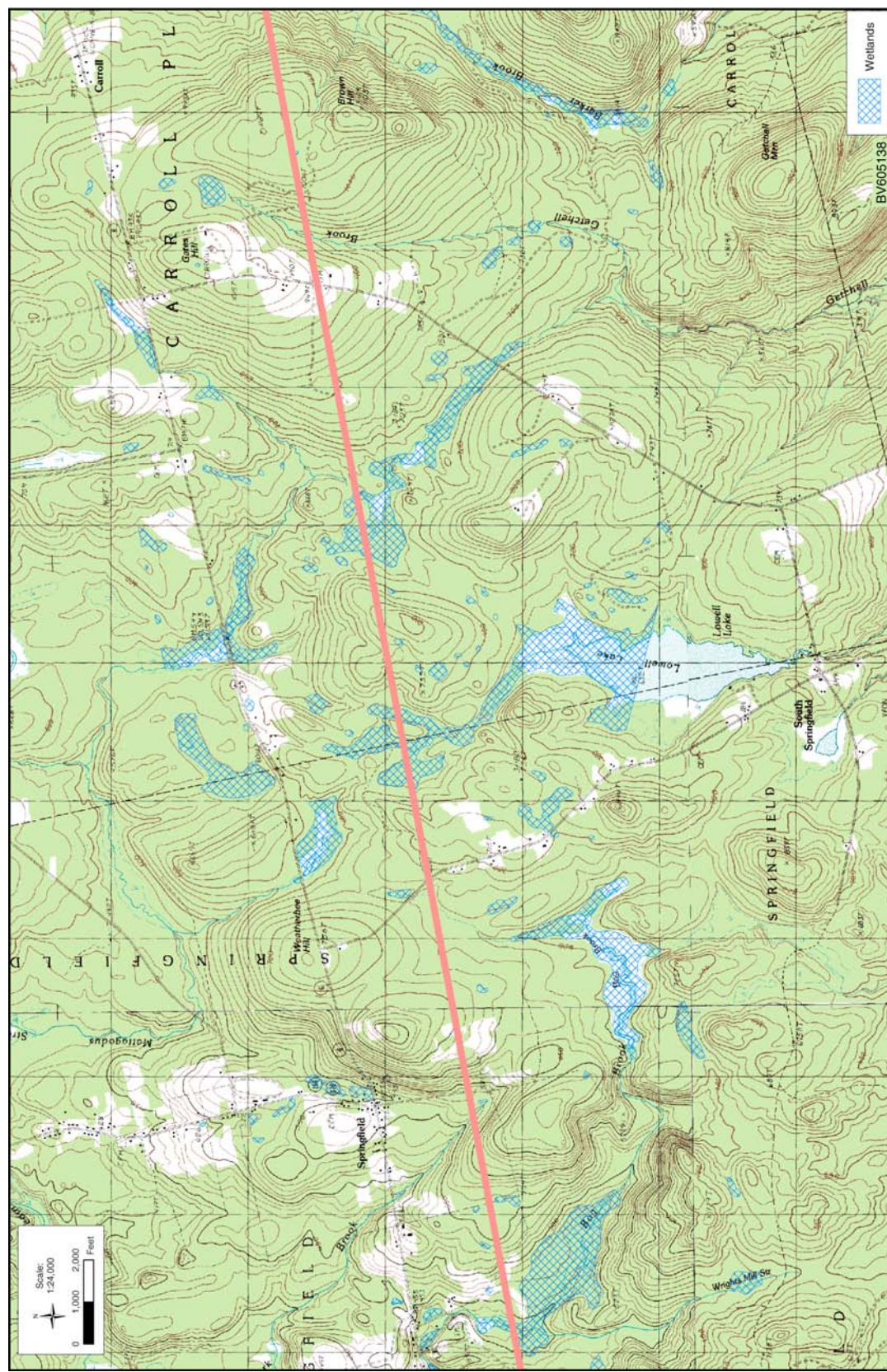


FIGURE ATT2-4q Wetlands along the MEPCO South Route (Cont.)

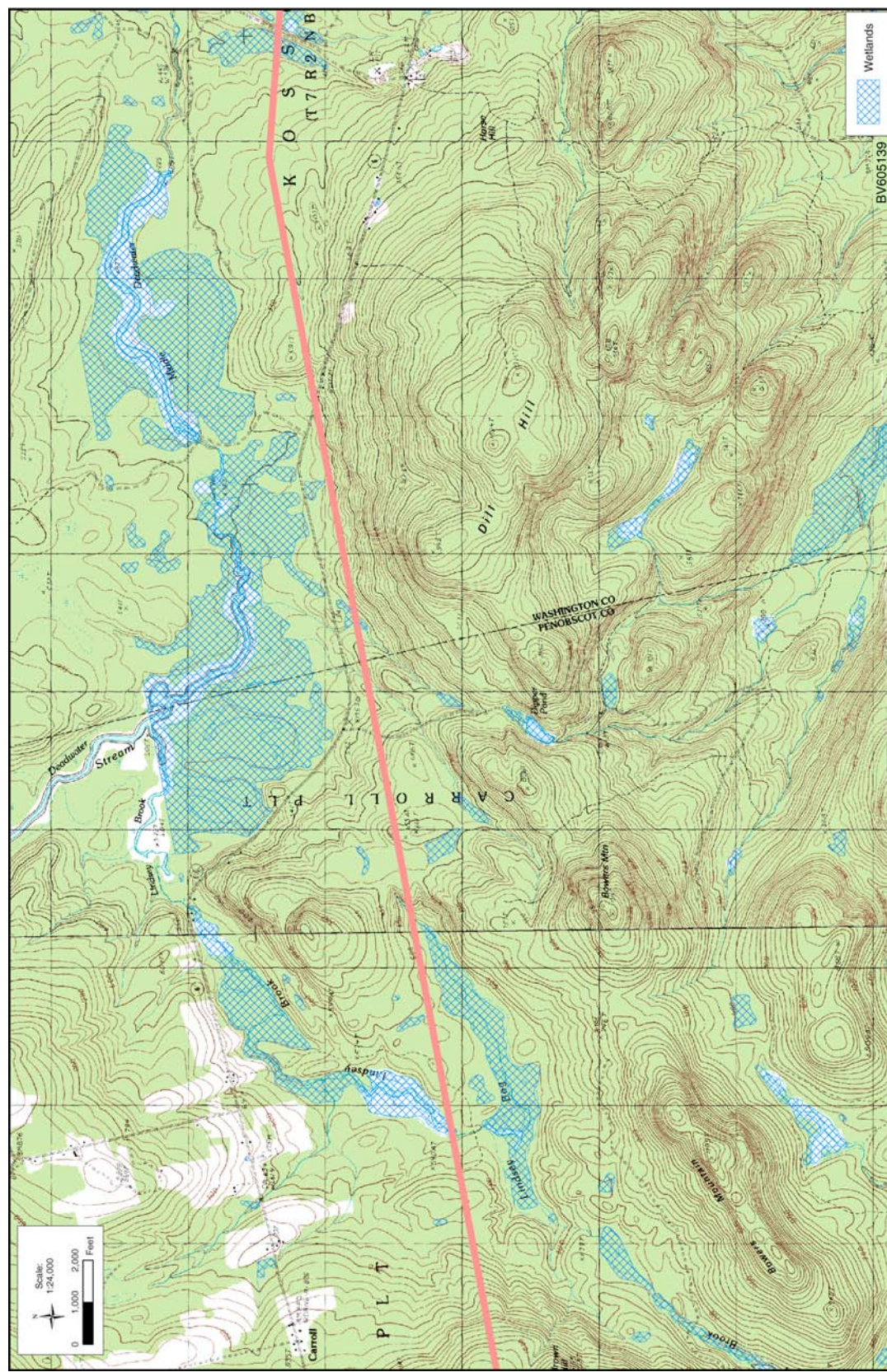


FIGURE ATT2-4r Wetlands along the MEPCO South Route (Cont.)

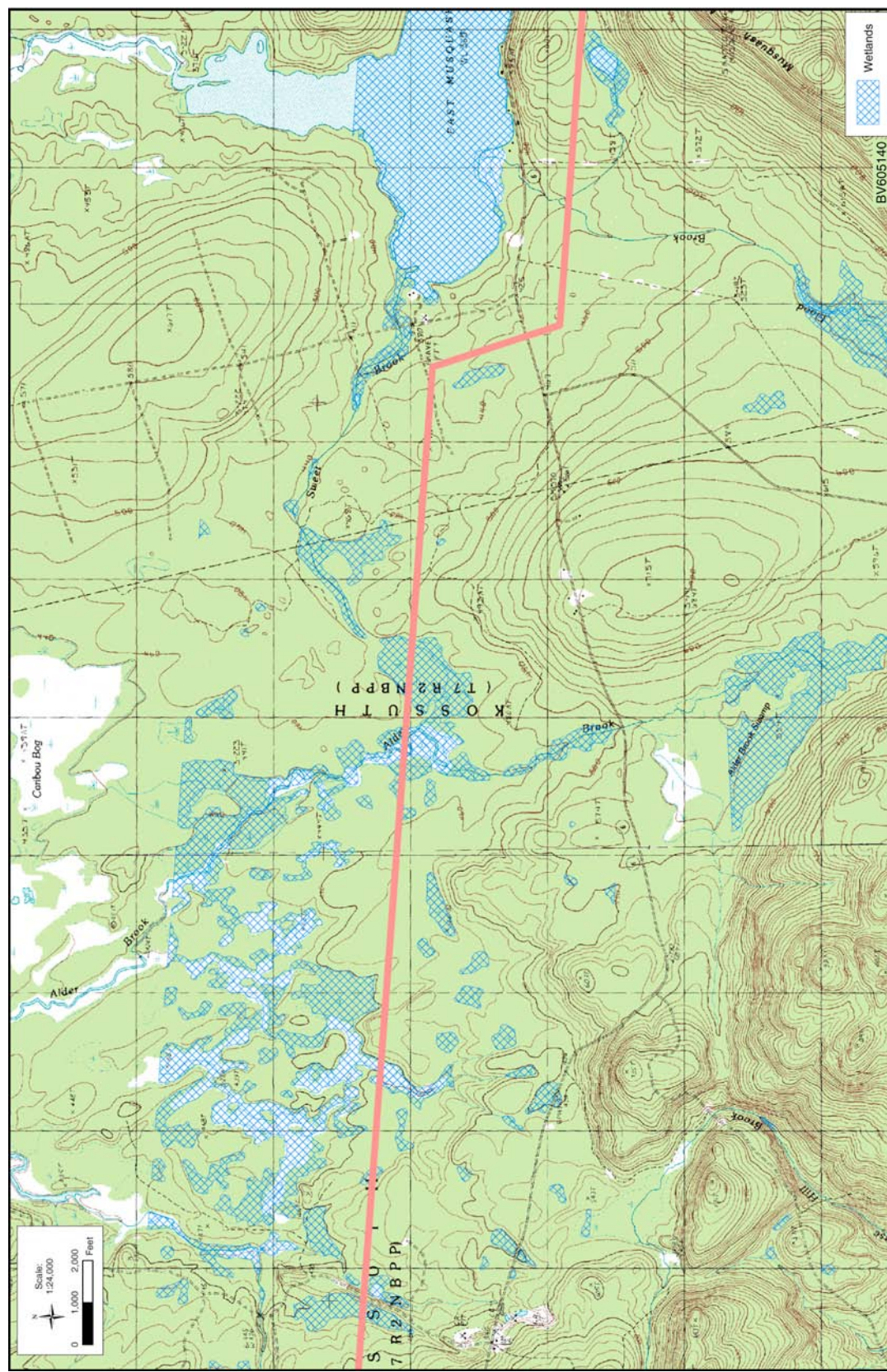


FIGURE ATT2-4s Wetlands along the MEPCO South Route (Cont.)

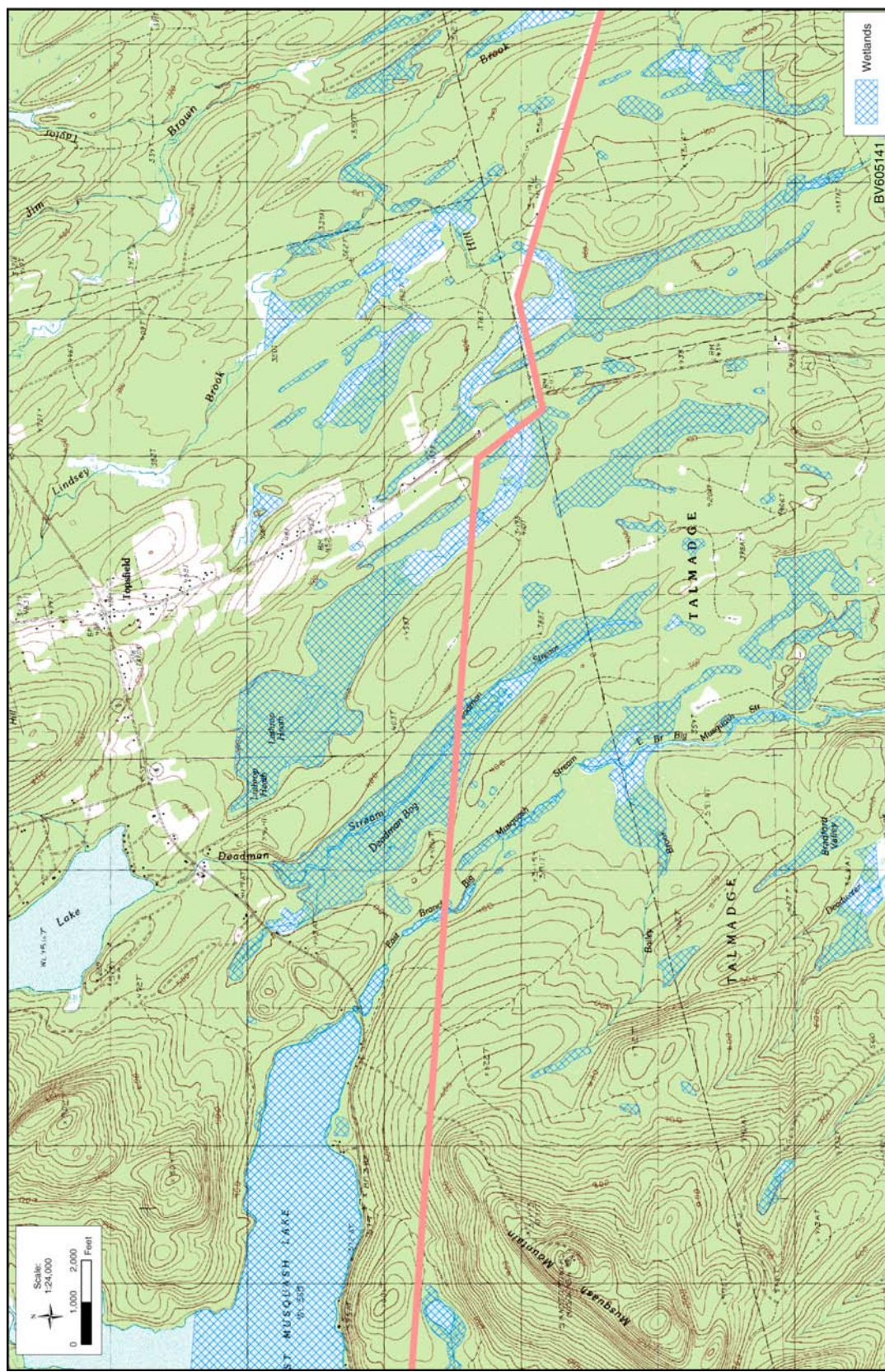
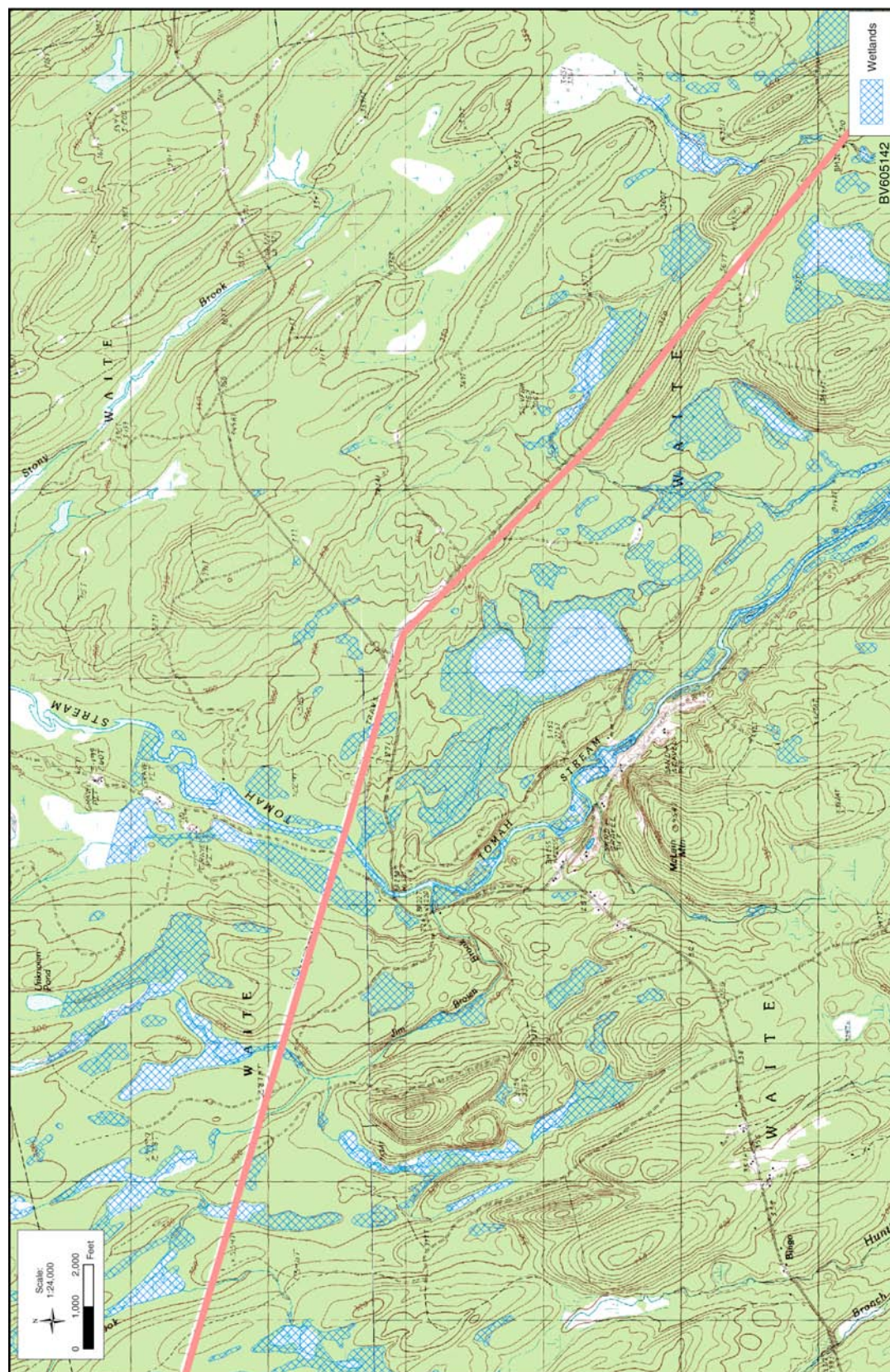
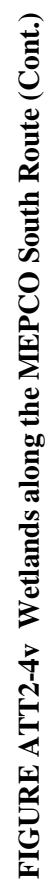


FIGURE ATT2-4t Wetlands along the MEPCO South Route (Cont.)

**FIGURE ATT2-4u Wetlands along the MEPCO South Route (Cont.)**



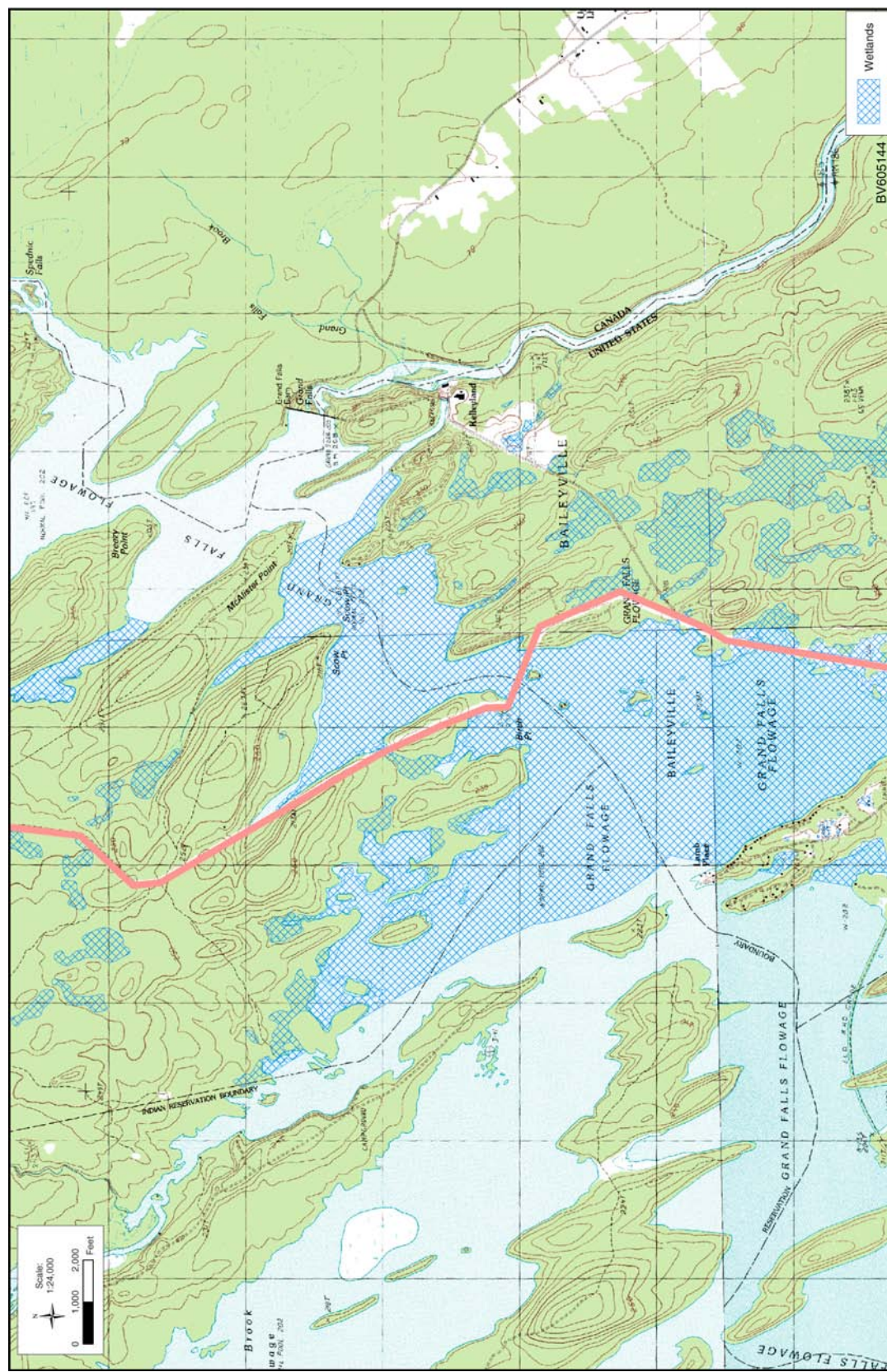


FIGURE ATT2-4w Wetlands along the MEPCO South Route (Cont.)

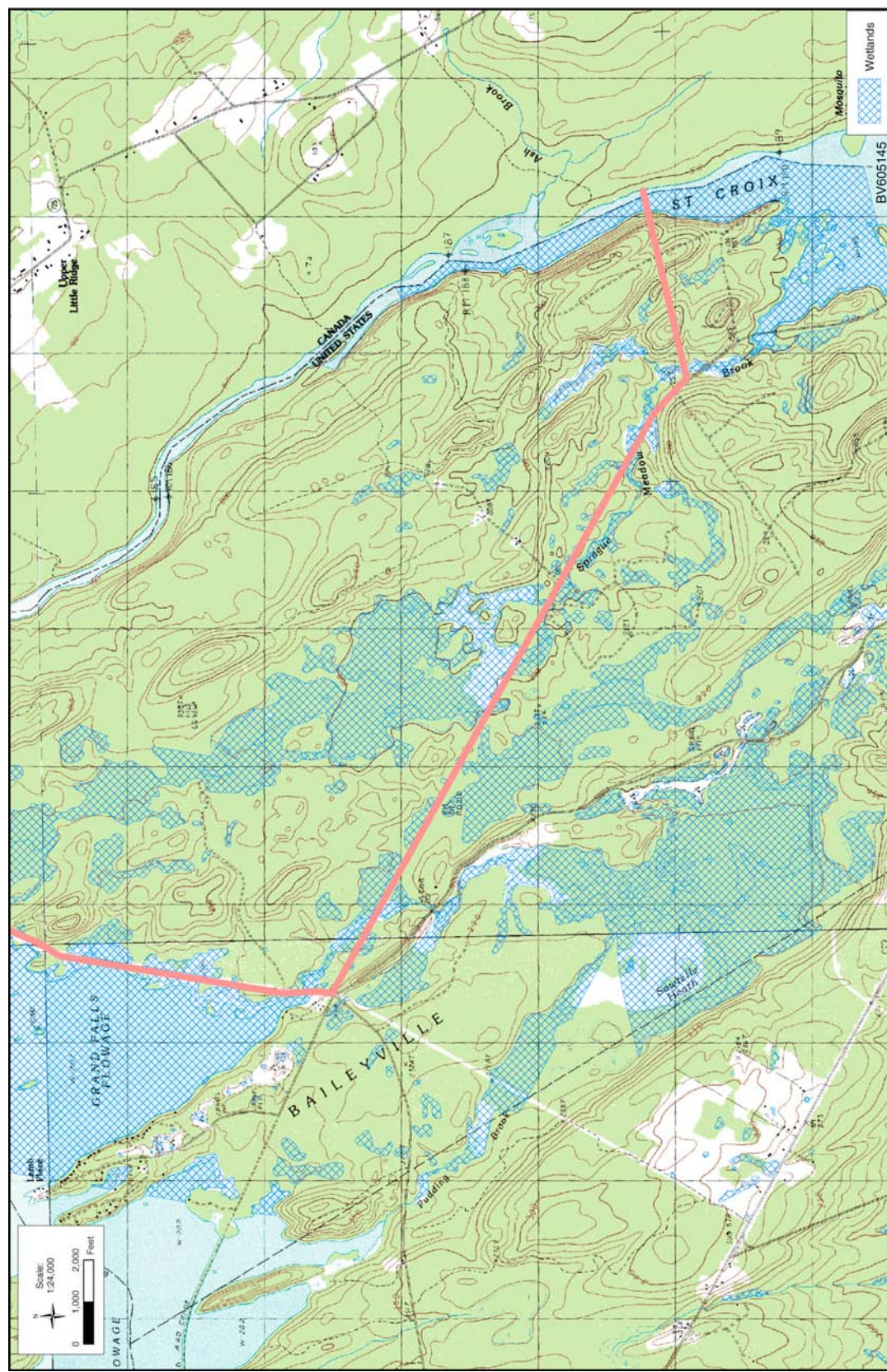


FIGURE ATT2-4x Wetlands along the MEPCO South Route (Cont.)

